

ARCHIVES OF OTOTOLOGY.

COMMUNICATIONS BETWEEN THE BLOOD-VESSELS IN THE MEMBRANOUS LABYRINTH AND THE ENDOSTEUM AND THOSE IN THE BONY CAP- SULE OF THE LABYRINTH.¹

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(From the Hull Laboratory of Anatomy of the University of Chicago.)

(With two text illustrations and two figures on Plates XIII. and XIV. of
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IF a section is made through the pyramid of the adult temporal bone, one can tell at a glance every point at which the labyrinth has been cut through by the dense ivory-like character of the bone which immediately surrounds its cavities. This ivory-like shell of the labyrinth constitutes its so-called bony capsule. There is no distinct line of demarcation separating the capsule of the labyrinth from the surrounding bone of the pyramid. The one passes imperceptibly into the other. In thickness the capsule measures from 2 to 4mm. A tube-like prolongation of the capsule encases the meatus acusticus internus.

In the fœtus, the labyrinth with its bony capsule can be shelled out completely free from the surrounding temporal bone. In the earlier embryo, before ossification has taken place, the labyrinth with its cartilaginous capsule can be separated from the surrounding structures even more readily. If such a preparation of the labyrinth with its capsule be examined, it will be seen that the outlines of the cavities

¹ Read before the American Otological Society, May, 1905.

which make up the chambers of the labyrinth are but faintly indicated on the outer surface of the capsule. The cochlea appears as a cone-shaped mass with but slight if any markings on the outer surface indicating the several coils of the cochlea within. The covering of the vestibule presents a surface free from special markings except for the depression of the fenestra vestibuli. The outlines of the semicircular canals are but partially indicated by the markings on the outer surface. The space included between the three semicircular canals, forming a solid triangle with its apex pointing towards the vestibule and the base directed in the direction of the upper posterior border of the pyramid, is completely filled in with this capsule. In the adult bone this space is partially filled in with spongy bone, while the ivory-like bone of the capsule extends but a couple of millimetres around each semicircular canal.

A question of interest and one of considerable clinical importance in connection with the capsule of the labyrinth is the relation of its blood-supply to that of the membranous labyrinth and the endosteum. Are the two systems quite distinct, or are there communications between them? Do the blood-vessels of the capsule anastomose with those that supply the endosteum and the membranous labyrinth? This is a question which has interested the clinician as well as the anatomist. If it could be established that blood-vessel communications exist between the capsule and the membranous labyrinth, this might explain, for example, a possible route for an infection to spread from the *cavum tympani* to the structures of the labyrinth.

The study of otosclerosis has in recent years brought an additional interest to all questions relating to the anatomy of the capsule of the labyrinth.

That the blood-vessels which supply the capsule of the labyrinth communicate freely with those in the surrounding structures has long been recognized. The blood-supply of the mucosa lining the tympanum sends branches which penetrate the bony substance of the promontory; blood-vessels from the dura penetrate the area between the semicircular canals at the *fossa subarcuata*; the blood-vessels of

the temporal bone which surrounds the labyrinth communicate freely with those of the capsule.

The question whether the blood-vessels of the membranous labyrinth and endosteum communicate with those in the capsule was first taken up by Hyrtl, who expressed the opinion that the blood-vessels of the labyrinth form a closed system, which does not communicate with the vessels of the surrounding parts from the point where the artery penetrates the labyrinth in the bottom of the internal meatus to the place where the veins leave the labyrinth (see text Fig. I).

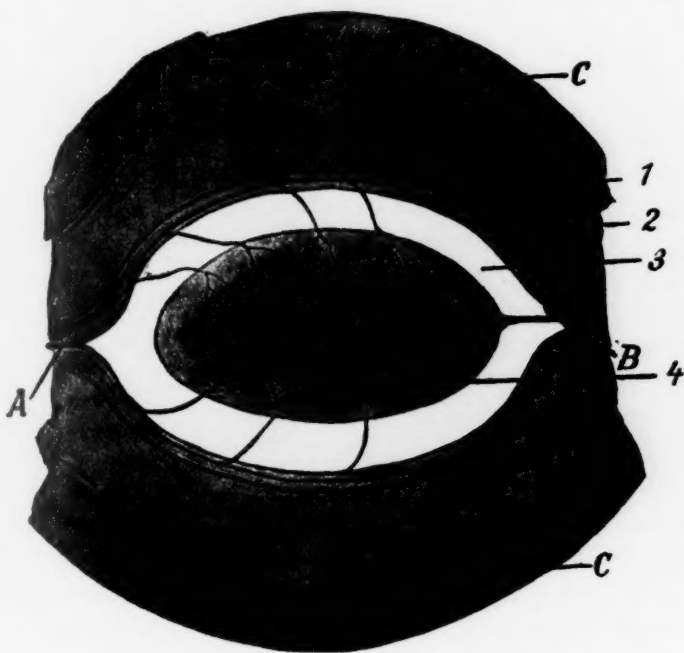


FIG. I.

Politzer, on the other hand, believed that he could demonstrate communications between the blood-vessels of the mucosa in the tympanum and the vessels in the membranous labyrinth (see text Fig. II). Between these two views opinion has been divided. The view of Politzer has been copied extensively in the clinical text-books on the ear. On the other hand, the opinion held by Hyrtl, that the blood-vessels of the labyrinth form a closed system, is the one

largely subscribed to by those who have made investigations on the subject.

The method chiefly used in working on this problem has been that of studying specially stained sections. Siebenmann,¹ in his work with metal corrosion, has made some interesting observations bearing on this subject. This method, however, does not permit of exact enough interpretation in regard to the blood-vessel connections between the capsule

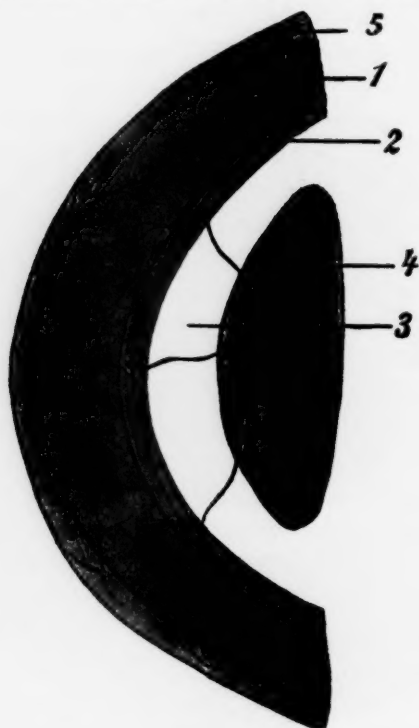


FIG. II.

and endosteum of the labyrinth to be of very definite value. The method of making celloidin casts of the labyrinth, which Eichler and Siebenmann used so successfully in studying the blood-vessels of the membranous labyrinth, and which I have used in studying the blood-supply of the labyrinth of the pig,² and that of the sheep and the calf,³ does

¹ *Die Korrosions Anatomie des menschlichen Ohres.*

² "Distributions of Blood-vessels in the Labyrinth of the Ear of *Sus Scrofa Domestica*." *Decennial Publications, University of Chicago.* University Press, Chicago, 1903.

³ *Zeitschrift für Ohrenheilk.*, Band xlviii., S. 381.

not lend itself to the study of this problem, because in this method the corrosion and subsequent removal of the capsule destroy just the vessels which we wish to study. In working with this method, however, I found that in making a celloidin cast of the labyrinth in which the capsule was still cartilage it was not necessary to remove the capsule at all, since the whole preparation, capsule as well, would clear up perfectly in creosote. It was also found that in cases where the labyrinth was prepared in this way, at the age when ossification was but partially advanced, the clearing up of the preparation, including the capsule, could still be satisfactorily accomplished in creosote, so as to permit of the study of the blood-vessels as they penetrated the region of beginning ossification. The problem was to get embryos at the age when the capsule was in the transition stage from cartilage to bone, where the process of ossification would be far enough along for the capsule to contain blood-vessels, and yet not so far advanced as to render it impossible to make the preparation sufficiently transparent in the clearing fluid.

The embryo of the calf was used because it was convenient to get this material at the proper stage of transition of the cartilage to bone to permit of its being studied by this method. The preparations were made by taking the labyrinth with its capsule shelled out from the temporal bone, the foetus having been previously injected with Berlin blue. A celloidin preparation of the whole was made and cleared in creosote. The size of the embryo calf that could be used for this method was between 20cm and 30cm in length. Such preparations, when cleared in creosote and examined with a stereoscopic microscope, would readily show any communication existing between the blood-vessels in the endosteum and those in the capsule. In cases where the preparation could not be made transparent enough to permit of careful study, the object was removed from the creosote and thick sections were cut free-hand. Other preparations where the process of ossification was farther advanced were decalcified and both thick and thin sections were made in the ordinary way. Such preparations could be stained before studying them.

By working with this method communications between the blood-vessels in the membranous labyrinth and those in the capsule could be demonstrated at a number of definite points, and the occurrence of these connections was found to be quite constant in the several dozen preparations studied. A characteristic of these communicating branches is that they always consist of a single large vessel which enters the capsule alone, except that it is often accompanied by a vein which returns the blood from the capsule to the labyrinth.

Since the system of blood-vessels in the membranous labyrinth is developed long before any blood-vessels appear in the capsule, we would naturally not expect to find vessels which develop later in the capsule send branches in to supply the membranous labyrinth. A single exception to this was found in a number of preparations where a large arterial trunk from the capsule joined the crus commune near its distal end, and distributed branches to the endosteum and membranous structures of the semicircular canals in the manner described below. In all the remaining places where connections between the blood-vessels of the membranous labyrinth or endosteum and the capsule were found, these consisted of branches which had penetrated the capsule from vessels that already existed in the membranous labyrinth. The points where such communications were found are as follows:

Cochlea.

1. Branches from the labyrinthine artery which lie in the endosteum on the under surface of the basal coil send branches at right angles to themselves into that part of the capsule which covers the under surface of the basal coil. (Plate XIII., Fig. 2, 1.)

2. Branches from the network which the labyrinthine artery forms in the meatus acusticus internus penetrate the capsule about the meatus, and extend upwards to supply the part of the capsule which encases the basal coil. (Plate XIV., Fig. 2, 2.) Branches from the same vessels are also sent upwards to supply that part of the capsule wedged in

between the vestibule and the distal end of the basal coil. (Plate XIV., Fig. 2, 3.)

3. At the junction of the distal with the middle third of the basal coil, at the point where the vena spiralis posterior takes its origin, an artery of considerable size, lying in the endosteum of the scala tympani, leaves the endosteum and supplies that part of the capsule between the basal coil and the vestibule. (Plate XIII., Fig. 1, 2, and Fig. 2, 4.) A vein from the area supplied by this artery runs parallel to the artery from the capsule to the labyrinth, and forms the beginning of the vena spiralis posterior.

4. Vessels which lie in the endosteum of the scala tympani, along the anterior border of the fenestra cochleæ, in several preparations were seen to communicate through a few small branches with a network of vessels which supply the tympanic side of the membrana tympani secundaria. (Plate XIII., Fig. 1, 3.)

5. In several preparations, the arteries which arch over the scala vestibuli in the proximal end of the basal coil were seen to give off small branches to the capsule immediately above the coil. (Plate XIII., Fig. 1, 1; Plate XIV., Fig. 2, 5'.)

6. Branches of the labyrinthine artery which supply the modiolus communicate with the vessels supplying the capsule of the cochlea by extending out along the prolongation of the capsule which in the proximal part of the basal coil separates this coil from the one above. (Plate XIV., Fig. 2, 5.)

Vestibule.

1. Vessels from the labyrinthine artery which arch over the anterior surface of the vestibule to anastomose with branches from the anterior vestibular artery, send a large number of branches upward and forward into the part of the capsule immediately above the anterior part of the vestibule and the part wedged in between the vestibule and the distal end of the basal coil. (Plate XIII., Fig. 1, 1, and Plate XIV., Fig. 2, 6.)

2. The part of the capsule covering the posterior surface of the vestibule is, as a rule, supplied by a large vessel which

springs from the labyrinthine artery at the base of the cochlea. (Plate XIV., Fig. 2, 7.)

3. A large stem from the anterior vestibular artery arches over the anterior surface of the vestibule between the fenestra vestibuli and the ampulla lateralis, and penetrates that part of the capsule lying under the lateral semicircular canal. (Plate XIII., Fig. 1, 4, and Plate XIV., Fig. 2, 8.) Branches from this vessel are distributed to the utricle. A branch often continues in the endosteum across the vestibule to anastomose with an artery, which takes its origin from the posterior vestibular artery and crosses to the anterior surface of the vestibule between the fenestra cochleæ and the ampulla posterior. A second branch from these vessels to the capsule is sometimes given off near the base of the crus simplex of the lateral canal. (Plate XIII., Fig. 1, 5.)

4. A branch from the posterior vestibular artery was observed in several preparations to penetrate that part of the capsule lying between the canaliculus cochleæ and the ampulla posterior.

Semicircular Canals.

At no point in the semicircular canals were vessels ever found running from the endosteum into the capsule. On the other hand, at the distal end of the crus commune a large artery from the capsule was seen in a number of preparations to penetrate the endosteum and send branches to the membranous canals. The cartilage wedged in between the arches of the three semicircular canals in the embryo is penetrated by a number of nutrient canals. Figs. 1 and 2, Nc. An artery lying in one of these canals runs backward and inward until it reaches the distal end of the crus commune, where it takes the place of the artery of the crus and sends a branch to supply the endosteum and membranous structure of the crus commune and a branch to each of the posterior and superior canals. (Plate XIII., Fig. 1, 6; and Plate XIV., Fig. 2, 9.) In one preparation no branches were given off by this vessel to the capsule (Plate XIII., Fig. 1, 6), while in others a number of branches supplied the capsule.

(Plate XIV., Fig. 2, 9.) Such an artery was long ago described by Sappey, but as far as I can learn his observation has never before been substantiated.

In summing up the results obtained in this research, in their bearing upon, first, the proposition of Hyrtl, that the blood-vessels of the labyrinth form a closed system, having no anastomoses with the surrounding structures from the time the labyrinthine artery penetrates the labyrinth at the bottom of the internal meatus until the veins leave the labyrinth; and second, the question of communications between the blood-vessels in the cavum tympani and those in the labyrinth, the following conclusions are reached:

1. The proposition of Hyrtl that the blood-vessels of the labyrinth form a closed system does not hold true for the labyrinth of the calf. At a number of places the ramifications of the labyrinthine artery send branches out into the capsule. The places are chiefly around the base of the cochlea and around the vestibule. In one place, the distal end of the crus commune, an artery from the capsule penetrates the endosteum and sends branches to the membranous canals.

2. In regard to the question of anastomoses between the blood-vessels of the cavum tympani and those of the labyrinth, such communications do exist apparently in the ear of the calf, for it has been shown that the part of the capsule of the labyrinth between the vestibule and the basal coil, the region which lies in front of the fenestra vestibuli, is well supplied by branches of arteries from the labyrinth from three distinct sources: first, branches from the arteries in the meatus acusticus internus (Plate XIV., Fig. 2, 3); second, vessels arching over the anterior surface of the vestibule (Plate XIV., Fig. 2, 6); third, a large artery lying in the endosteum of the scala tympani in the distal third of the basal coil (Plate XIV., Fig. 2, 4).

Since the blood-vessels in the mucosa of the tympanum penetrate freely the part of the capsule forming the inner wall of the cavum tympani, it is quite evident that in the calf, at least, communications between the blood-vessels of the cavum tympani and those of the labyrinth do exist.

Explanation of Plates.

Plate XIII.

Fc—fenestra cochleæ.

Cf—canalis facialis.

Rua—ramus utriculo-ampullaris.

Fv—fenestra vestibuli.

Cs—canalis semicircularis superior.

Cl— " " lateralis.

Cp— " " posterior.

Nc—nutrient canals.

1, 2, 3, 4, 5—Branches from the labyrinthine artery which supply the membranous labyrinth and endosteum, penetrating the capsule of the labyrinth.

6—Artery from the capsule of the labyrinth supplying the endosteum and membranous semicircular canals.

Plate XIV.

Mai—meatus acusticus internus.

Fv—fenestra vestibuli.

S—sacculus.

U—utriculus.

De—ductus endolymphaticus.

Cc—crus commune.

Nc—nutrient canals.

1, 2, 3, 4, 5, 5', 6, 7, 8—Vessels which supply the endosteum and membranous labyrinth, branches of the labyrinthine artery, sending stems into the capsule.

9—Artery supplying the capsule of the labyrinth, sending branches to the endosteum and membranous semicircular canals.

REPORT OF A CASE OF PANOTITIS RESULTING IN MENINGITIS, WITH PATHOLOGICAL FINDINGS.¹

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(With two photomicrographs on Text-Plate No. II.)

THAT panotitis is not more frequently reported is probably due to the difficulty of obtaining permission for autopsies, and possibly to the greater difficulty of preparing the organ for microscopic examination after the specimen has been obtained. The decalcification and sectioning of the temporal bone is a tedious, slow process, and after weeks of labor the result is often exceedingly disappointing. It is doubtful whether there is another portion of the human anatomy so difficult to obtain (in a fresh condition) as the temporal bone, due primarily to our laws, enacted of course for the protection and greatest good of the greatest number, and, secondly, to the apathy of those in charge of the dead. Removal of the temporal bone for pathological examination is the last thing thought of.

The case I have the privilege of reporting, through the courtesy of Dr. Gorham Bacon, is of interest, on account of its rather unusual course and the character of the infection.

Miss D. H., a nurse, forty-seven years of age, entered the service of Dr. Bacon, in the New York Eye and Ear Infirmary, February 7, 1904. Her chief symptoms were those of dizziness and staggering gait. She gave a history of an acute attack of

¹ Read before Section of Otology, New York Academy of Medicine, May meeting.

otitis media, which began six weeks previously with chill, pain, fever, etc. The attack had apparently run its course, and she was being treated for the resultant deafness. Four days previous to admission she was seized with great dizziness and weakness during an "examination of the left ear with a probe." There was no chill and no vomiting at this time.

Examination showed acute otitis media on the left side, a slight discharge, and a reddened and somewhat swollen drum membrane. There was no mastoid tenderness. The use of Siegel's otoscope caused marked vertigo when the air in the external canal was compressed. The condition of her hearing was not recorded. Her urine was normal.

During the subsequent three days she had several attacks of vertigo and nausea, and ran a slight temperature. I am under the impression she had slight aphasia, but there is no mention of this in the history. However, the symptoms did not seem to warrant operative interference up to this time. On the fourth day after admission she had a chill, there was slight mastoid tenderness, and the temperature suddenly arose to 103.7° F. There was great pain in the back of the neck along the spine; meningitis had occurred. The temperature remained high on the following day, and on the sixth day after admission fell to 100° just previous to death, which occurred February 13th, or about seven weeks after her first chill.

Autopsy.—The dura was adherent to the brain on each side of the superior longitudinal fissure from near the beginning of the first frontal convolution to the fissure of Rolando. There was marked purulent lepto-meningitis over the superior surface of both hemispheres. The process was, however, more marked at the base of the brain. There were a few adhesions about the medulla at the foramen magnum. The region of the left island of Reil was examined and found normal. The ventricles were free from pus, and the interior of both cerebellar lobes was normal.

There was no discoloration of, or opening through, the dura over the petrosa. When the dura was removed from the left petrosa pus was found on the inner aspect of the superior semicircular canal ridge, and the bone was carious at this point. Further dissection revealed fluid pus

TO ILLUSTRATE DR. DIXON'S ARTICLE ON PANOTITIS RESULTING IN MENINGITIS.



FIG. 1.—Vertical section through tympanum showing (a) tympanum filled with granulation tissue and pus, (b) vestibule filled with pus, (c) foramen ovale with foot-plate of stapes, pus passing into vestibule on each side, (d) scala vestibuli, (e) facial nerve, (f) tensor-tympani muscle. From a photomicrograph by the author. $\times 35$ diameters, reduced.

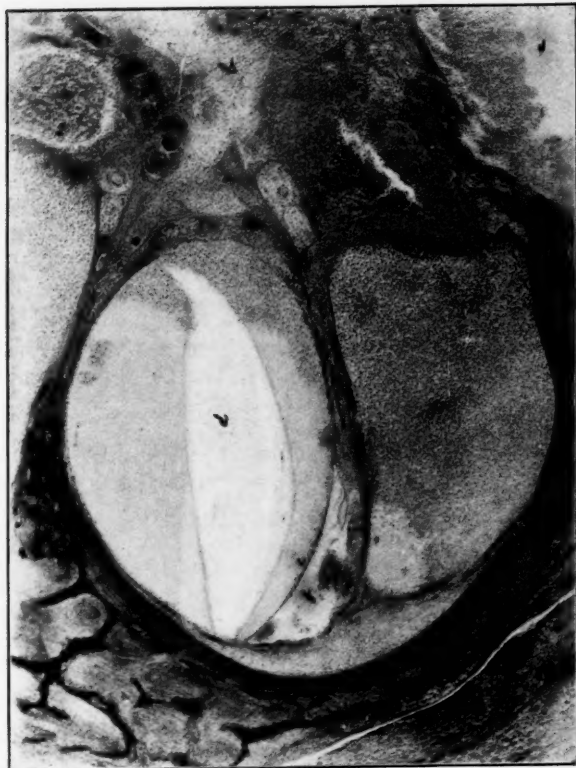
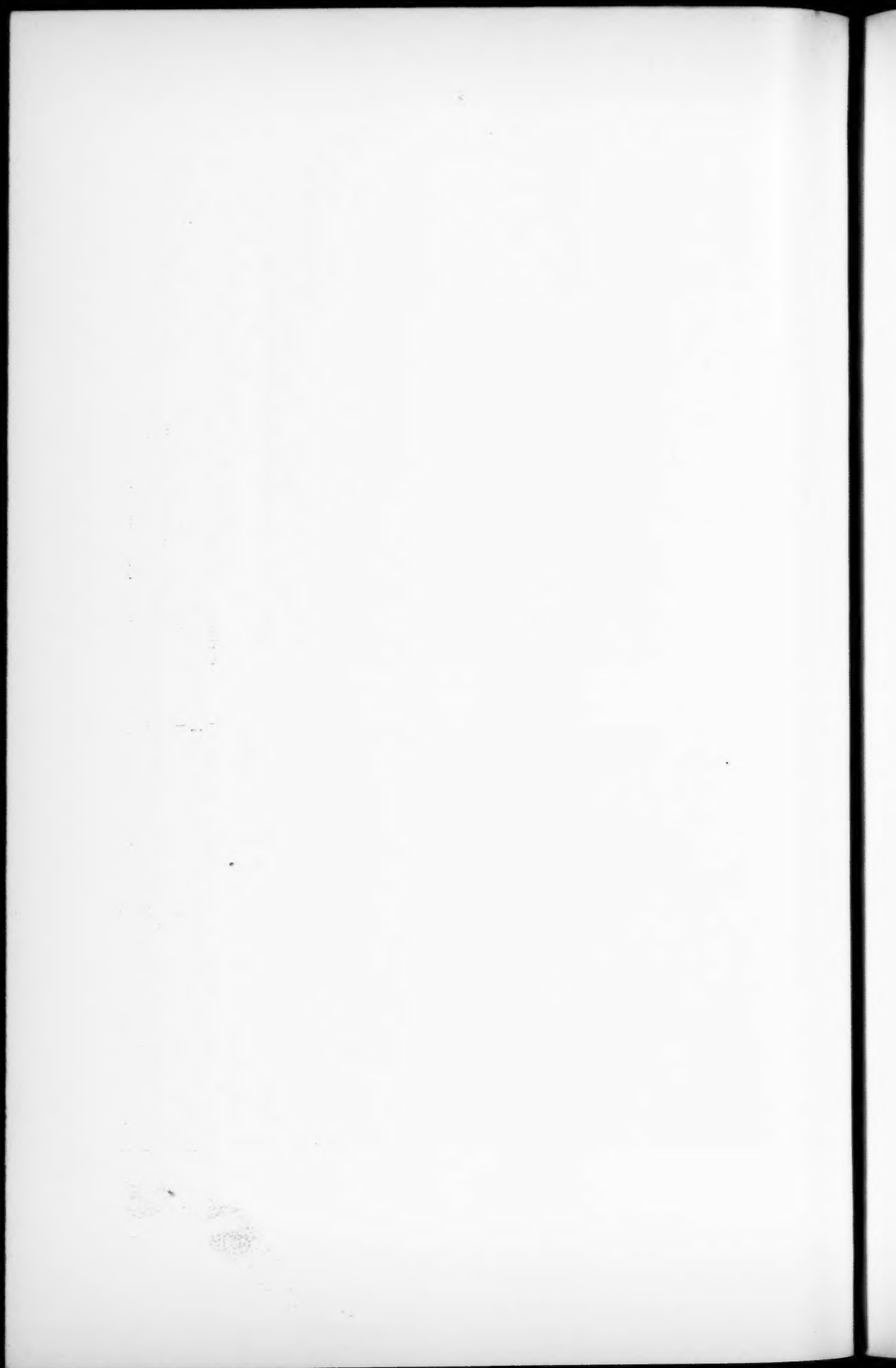


FIG. 2.—Transverse section at about the middle of the first turn of the cochlea. (a) Internal auditory meatus; (b) modiolus infiltrated with pus, which is freely passing from (a) into (c) the scala tympani; (d) scala vestibuli, also containing pus. This cavity was not completely filled with celloidin, and contraction caused retraction of (e) Reissner's membrane. (f) Scala media, showing a small hemorrhage. From a photomicrograph by the author. $\times 65$ diameters, reduced.



in the left sigmoid sinus. The petrosa was then removed, and while this was being done pus was noted to ooze through an oval opening in the tegmen antri, 1.5 x 1mm in diameter. The mastoid was soft and full of pus. The internal auditory canal was also filled with pus.

Sections of the bone show every cavity filled with pus or granulation tissue, or both. The stapes gives no evidence of caries, but it was partially dislocated, as sections show the foot-plate decidedly out of position and pus passing freely around it from the tympanum to the vestibule. (See Fig. 1.) There was considerable pus in the perilymph spaces of both vestibule and semicircular canals, but little within this portion of the membranous labyrinth; hemorrhages, however, were noted here.

The mucous membrane of the tympanum was enormously thickened, and the cavity filled with pus. The lower part of the membrana tympani was intact, but greatly thickened and hyperæmic.

The cochlea was sectioned from base to apex in the vertical plane. The scala tympani was filled with pus; less pus was found in the scala vestibuli, while there was little or none in the scala media, though a few hemorrhages were present, as in other portions of the membranous labyrinth already referred to. The round window was probably perforated.

The infective germ was Friedlander's pneumococcus.

The tract of infection to the meninges appears to have been through the oval window to the vestibule, thence to the vestibular nerves, and along the sheath of the seventh pair.

The interesting points in the case are that the patient had an acute purulent otitis media, which had apparently subsided, and was being treated for the resulting deafness. To my mind everything points to the stapes having been moved during the examination with a probe; the existing condition was aggravated, though there was little to indicate its extent until the fourth day after admission, when suddenly there was a chill, the temperature went up, meningitis occurred, and the patient was dead in thirty-six hours.

This case seemed to call for an investigation of my bacteriological examinations during the past four years. They were found to comprise about 1050 cases of acute and chronic purulent otitis, with and without mastoiditis; 2.75 % of the infections were Friedlander's pneumococcus, or more properly the bacillus mucosus capsulatus. Fifteen cases, or about 50 %, had existed for forty-two days and over before operation. Of these, two had perisinuous abscess with Bezold perforation; one had perisinuous abscess and cortical perforation with subperiosteal abscess; four had epidural abscess (one of which died of meningitis); one had panotitis and died of meningitis; and one had brain abscess, which also died. Six cases had subperiosteal abscess.

Of those cases which had existed under forty-two days, four promptly recovered after paracentesis, but mastoid operation was required on the remaining ten, and all did well except one patient who died of pneumonia.

INFECTIVE ARTHRITIS COMPLICATING OTITIS MEDIA.¹

BY WELLS P. EAGLETON, NEWARK, N. J.

INFECTIVE arthritis is of peculiar interest to the otologist, because the original infection frequently comes from the ear.

The subject, however, does not appear to have had the attention which it demands; as a result of which, entirely different lesions, running distinct courses, with decidedly varied outcomes, and demanding altogether diverse lines of treatment, have been classified under the general term of infective arthritis.

A practical subdivision has been implied by Bloodgood which, undoubtedly, has therapeutic value, viz.:

First. Inflammation caused by the toxins of micro-organisms where the germs do not enter the joint; such might be called toxic arthritis.

Second. Invasion of the joint by micro-organisms themselves.

Third. Involvement of the joint by a neighboring osteomyelitis.

Toxæmic Arthritis.—To such belong most of the cases following sinus thrombosis. They are characterized by swelling of several joints, pain, and tenderness, but all symptoms usually disappear with rapidity. The fluid obtained by aspiration is sterile. It is the old rheumatism of toxæmia, well known to every general practitioner, especially in cases of scarlet and typhoid fever, and which, because of its

¹ Read before the Otological Section of the New York Academy of Medicine, February, 1905.

subsidence, without treatment, has often been the cause of postponement of early surgical intervention in cases of true infective arthritis.

CASE 1.—Under the care of Dr. Charles J. Kipp. Male, adult. Admitted to the Newark Eye and Ear Infirmary suffering from sinus thrombosis following otitis media. Several days after operation several joints swollen and inflamed with intense suffering. Gradual subsidence of all symptoms. Entire recovery.

CASE 2.—Seen in consultation with Dr. Frederick Baker. Male, aged twenty-four. Previous history negative. Never suffered from rheumatism. Otitis media suppurativa following coryza. Paracentesis made under nitrous oxide. Very profuse discharge. Temperature 101–103° F. One week later, pain in right knee, accompanied by only slight swelling. The next day the left knee similarly affected, and later both ankles, accompanying which a distinct pericardial or possibly an endocardial murmur could be heard, which was not present on the previous day. Gradual recovery.

This case is possibly one of acute articular rheumatism occurring independently of the otitis, which view is supported by the appearance of the heart murmur, but the continued septic temperature from the beginning of the otitis media until the subsidence of the joint affection, in association with the character of the joint lesions, made me regard it as toxic and not rheumatic.

The second class, which may be designated true infective arthritis, can be subdivided into as many divisions as there are micro-organisms capable of causing joint inflammation; the most common of these are the gonococcus, staphylococcus, streptococcus, pneumococcus, and the bacillus of typhoid and glanders. These vary in their virulence from the gonococcus which, but infrequently, causes a purulent arthritis to the pneumococcus which is, almost unexceptionally, purulent from its beginning.

Certain it is, that in the very large proportion of cases of infection of the synovial membrane, by the ordinary micro-organisms themselves, suppuration does occur; and unless

this is early recognized, not only is the joint sure to be greatly damaged, but the life of the patient seriously imperilled.

This has been conclusively demonstrated, especially in cases of pneumococcic infection, and is of particular interest to otologists because of the frequency (especially in children) in which the original point of entrance is from the ear.

Davis and Brown,¹ in an examination of thirty-nine fatal cases of multiple lesions, bacteriologically demonstrated to be caused by the pneumococcus, found an otitis media as the primary lesion in four, or about 10 per cent., and as a sign of metastasis in two more, while thrombosis of a sinus twice occurred. One of the four cases caused a suppurative arthritis of several joints, in addition to other lesions.

The ear, in fact, is the *most* frequent source of *general* pneumococcic infection in children. Netler states that twenty-nine out of forty-six cases, or about 63 per cent., originate from otitis media.

Dugeon and Branson,² in reporting five cases of pneumococcic arthritis, one of which originated from an otitis media, and another probably so, as autopsy showed "thick yellow pus in the right middle ear," say: "It has been our experience and that of our predecessors, that the pneumococcus practically monopolizes the etiology of infective arthritis during infancy, and about up to the end of the fifth year of life." They also say: "The character of the local lesion, in a typical case, is almost distinctive, the most striking feature being the nearly complete absence of circumarticular inflammation."

This latter fact was forcibly demonstrated in a case which I was allowed to see by the courtesy of Dr. P. V. P. Hewlett.

CASE 3.—Male, adult. Admitted to the Newark City Hospital suffering from lobar pneumonia. During convalescence right ankle *accidentally* discovered to be swollen, although the patient had made no complaint of pain or discomfort. A few

¹ *Lancet*, Oct. 8, 1904.

² *Lancet*, Aug. 1, 1903, p. 316.

days later joint opened and drained; purulent exudate, which contained large numbers of pneumococci in pure culture.

Osteomyelitis, with Secondary Arthritis.—The symptoms and diagnosis of acute osteomyelitis are now so well understood that when the lesion primarily occurs in the shaft of a long bone it is not apt to be overlooked, but when it complicates a general pyæmic condition, and involves a bone in the neighborhood of a large joint, the joint symptoms mask the original bone lesion almost completely, with the result that treatment may not be as satisfactory as it would be if the joint *and the bone* were both surgically attacked.

Acute osteomyelitis, with a joint complication, occurs almost entirely in young children, before complete ossification of the epiphysis, the site most frequently affected being the diaphysial end of the epiphysis, thus bringing the joint not only in close contact with the lesion, but in many joints within the joint capsule itself.

The younger the child, the more apt is the arthritis to be secondary to an osteomyelitis.

A case of sinus thrombosis complicated by infective arthritis following osteomyelitis, with spontaneous dislocation of both hips.

CASE 4.—Seen in consultation with Dr. Whiteneck. D.S., six years of age. Had had several attacks of otitis media. Following tonsillitis, pain in ear which continued for several days. Under ether, a paracentesis made. No pus found. Next day temperature 99° to 104° F., accompanied by two chills. Blood examination showed marked leucocytosis. Following day another chill accompanied by a rise of temperature from normal to 104° F. Was admitted to the Newark Eye and Ear Infirmary and operated upon that night. On way to Infirmary complained of pain in right knee, but no importance attached to complaint.

Operation.—No pus in antrum or mastoid but a thrombus in sinus low down towards jugular bulb. Free bleeding from above but none from below. Jugular partially excised. Above facial, where lower end of thrombus could be seen, the open jugular wall sewed into external wound.

Following operation, temperature continued high. Twenty-

four hours later, another chill, great pain in right knee, dressing removed, and sterile normal salt solution syringed from above out through wound in neck. Next day, complained of pain in both knees, patient lay stiffly in bed unable to turn from side to side, but examination revealed only slight dry crepitus of both hips; no redness or swelling of either hips or knees. On third day after operation, examined by Dr. Sydney Twinch. General septic condition; temperature from 102° to 105° F. One week later, left hip found to be dislocated upwards onto the dorsum of the ilium. Joint aspirated. No pus found. Extension apparatus applied. Three days later, exactly two weeks after sinus operation, abscess around joint opened and drained. Three days later, right hip found dislocated in same way, followed by abscess, which was also opened and drained. Both hips could be easily reduced, but it was impossible to keep them in position. From this time on for next four months, profuse discharge from both joints, several openings being made at different times.

Five and a half months after original operation, all sinuses healed. Child could sit comfortably, but was able to walk only with the aid of two crutches. Both hips still dislocated. Radiograph showed erosion of both heads of the femurs, showing that the case was probably originally an acute osteomyelitis of the epiphysis, followed by an infective arthritis, thus explaining the dislocation before any effusion into the joints.

The prognosis of toxæmic arthritis is excellent both as regards the life of the patient and the mobility of the joint.

In true infective arthritis and that complicating osteomyelitis, the mortality is very high, while the mobility of the joint is almost sure to be seriously impaired, if not altogether lost. In an examination of 79 cases of pneumococcic arthritis, being all that I could find reported, 48, or 60 %, died.

The treatment depends altogether upon the class to which the arthritis belongs. An inflammation of a joint appearing during the course of an otitis media, or a sinus thrombosis, warrants aspiration at once. If examination of the fluid by cover-slips and cultures demonstrates it to be sterile, rest, and the placing of the joint in proper position, may be all that is necessary. If over-distention by fluid is

threatened, repeated aspirations may be required. Placing the joint in proper position, in such cases, is highly important, as spontaneous dislocations, from distention, have been reported. When a joint contains pus, it should be promptly opened, although cases of recovery, following aspiration, rarely occur. Nevertheless, in every case in which the aspirated fluid contains pathogenic micro-organisms, even if the synovial fluid is not *purulent*, the best results are obtained by opening the joint and inserting a guttapercha drain.

This was demonstrated in a case under the care of my colleague, Dr. Seidman, in which, following an otitis media, several joints became involved: one (the sterno-clavicular) was opened; no pus was found, but a roughness of the articular surfaces; the inflammation subsided immediately. Another joint (the knee) was not opened, because the fluid aspirated was not purulent; here the inflammation continued, and within a few days the fluid was purulent.

In Dr. Halstead's clinic, where early opening on bacteriological examinations has been in vogue for the past six years, it has been demonstrated that such a procedure not only greatly lowers the mortality, but also, instead of interfering with the mobility of the joint, actually prevents immobility by cutting short the suppuration.

DOUBLE MASTOIDITIS COMPLICATED BY AN INTERCOMMUNICATING SUBOCCIPITAL ABSCESS.

BY HENRY B. HITZ, M.D., MILWAUKEE.

I N presenting the following case for record, I wish to state that, in an experience of 130 mastoid operations for all causes, it stands absolutely unique; nor has search of the literature at my command been successful in bringing to light anything of a parallel character.

Politzer,¹ in his description of mastoid complications, says: "The breaking through of the abscess on the inferior and medial sides of the mastoid process often leads to complications of *long duration*, as the pus extends to the subfascial layers of the neck." Oppenheimer² states that "in rare cases there is a tendency to extend backward toward the region of the splenius muscle, a case being reported by Swan in which a trapezius abscess was formed, . . . complete recovery" following operation. In considering the direction pus invasion of this region may take, he says: "It may find its way forward along the track of the digastric muscle, and point in the pharynx, or backward toward the nucha and spinous processes of the cervical vertebræ, but always remaining beneath the deep fascia of the neck."

C. V., aged fifty-seven, male, German, married, shoemaker and farmer. Has four children living and well.

On August 5, 1904, he was referred to me while suffering from considerable pain in and behind the left ear, and a copious fœtid

¹ *Diseases of the Ear*, 4th Edition, 1902, p. 530.

² Remarks on Bezold's Mastoiditis, *Laryngoscope*, xv., 1905, p. 51.

purulent discharge from the left auditory meatus. He gave the following history: General health had always been good. Never had syphilis or other venereal disorder. In April, 1904, he was suddenly taken ill with grippe, complicated later by an acute otitis media of the left ear, with severe mastoid pain. After several days the drum ruptured spontaneously, discharging at first sanguino-serous, and later purulent, matter. A physician in his home town made a cut behind the ear (Wilde?), the opening of which remained but for a short period. The pain lessened somewhat, but has continued to the present time, while the purulent discharge has been continuous and foetid.

The patient is a large, well-preserved man, weighing about 170 pounds.

On examination the *left ear* showed a copious, foetid, purulent discharge in the meatus, which, on being removed, rapidly reappeared through a large perforation of the membrana above the short process. There was marked sagging of the posterior-superior wall of the canal. Behind the auricle was a scar about one inch long. The mastoid over the antrum was extremely sensitive to pressure. No bulging or œdema, however, was present. One very noticeable peculiarity was the rigidity of the neck, considerable pain being complained of upon forcible rotation of the head, but could not be localized, nor was there any external manifestation of trouble in the region of the neck.

The right ear showed scaling of the meatal walls and some thickening and retraction of the drum, though the malleus was clearly defined.

There was no sagging of the posterior wall of the canal. Hearing distance for the watch tick, by air conduction $\frac{7}{8}$. Careful examination of the mastoid region on this side failed to reveal any apparent disturbance, deep pressure over this antrum being negative, except for the neck pain previously mentioned. His temperature was 100° F., pulse rate 98, and he complained of sleeplessness.

He was sent to the Knowlton Hospital, and on the following morning a radical (Stacke-Schwartz) operation was performed on the left mastoid. Extensive caries was found to exist, the dura being exposed over the antral and attic vault. The mastoid tip was laid bare and completely removed, as was the outer table as high as the zygomatic cells. A tongue flap was made of the membranous canal, and the wound closed primarily. Recovery

was apparently rapid, the external wound healing without reaction. The temperature, which had ranged between 99° and 100°, dropped to normal on August 7th, and remained so until August 13th, when at his urgent request the patient was permitted to leave the hospital and come to the office for subsequent dressings. This was done through the enlarged external canal, and consisted of dry packing with iodoform strips. The only adverse symptom was a continuance of the stiffness in the neck, now apparently localized in the region of the mastoid attachment of the left sterno-cleido-mastoid muscle, but sometimes referred to the opposite side of the neck. Frequent examinations were made of the right ear, but failed to develop more than as stated above. On August 18th, however, after a night of restlessness and some dull earache, and as his temperature taken that morning in the office registered 99°, paracentesis of the membrana was done, but with negative results.

On August 22d some slight œdema over the right mastoid was observed, and deep pressure over the antrum seemed to cause increased pain in the neck. As I was going away for a few days, I suggested to my associate, Dr. Seaman, the advisability of making an exploratory operation on the right mastoid. During my absence, August 26th, the right mastoid was opened (Schwartz) by Dr. Seaman, and found to be extensively necrotic with a large sequestrum involving the inner table over the lateral sinus. The pus was of a thick creamy character, and the cavity was filled with detritus and flabby granulations. The outer table was completely removed and the wound packed with iodoform gauze.

Temperature before operation was 99°, pulse 84, respiration 18. During the following week the temperature ranged between 97° and 100° after which it remained normal until September 3d, when I again took charge of the case. Both mastoid wounds were clean and granulating nicely, while the patient's general condition was apparently good, although the stiffness in the neck, making it impossible to turn the head, still persisted, without, however, any external manifestation of trouble in this locality, either anteriorly or posteriorly, nor was any demonstrable with the aid of a throat mirror. This persisted until September 25th, though in every other way he seemed to be progressing satisfactorily. The *left ear* cavity (Stacke-Schwartz) had become covered with epithelium, excepting one small area

in the floor of the tympanic cavity. Temperature ranged between 98° and 99°.

On September 26th, while examining the neck by deep pressure over the site of the occipital artery on the *right side*, pus was forced into the right mastoid wound cavity (Schwartz), which up to this moment had been absolutely clean, and upon further investigation, by continuous deep pressure, pus could be seen welling up through a small opening in the innermost part of the antral floor. A probe was passed for fully an inch into this opening in a downward and forward direction, and its removal was followed by a copious flow of thick creamy pus. On the following day the right mastoid wound was reopened and thoroughly explored. An incision was carried backward as far as the lambdoidal suture, the flap reflected downward, and the base of the occipital bone carefully explored. A blunt probe revealed the presence of a pocket of thick pus beneath the occipital attachment of the deep muscles of the neck. During the exploration of this pocket, attention was called by the anæsthetist to the other (left) ear, from the external meatus of which *pus had begun to flow* in considerable quantity, first clear, then bloody, and later becoming watery during flushing of the right wound. At this time the *left ear* (Stacke-Schwartz) was practically healed, with the exception, noted above, of a small area of granulation in the floor of the cavity, and had been continuously clean and free from the slightest suggestion of pus, beyond that which might come from the small granulating area.

The right wound was carefully explored to determine the line of communication with the left ear, but this was unsuccessful. A large counter-opening was then made in the back of the neck, two inches behind the sterno-mastoid and the same distance below the occiput; free drainage was established, connecting with the mastoid wound, and moist dressings were applied. The left ear was also cleansed and a loose packing inserted. The patient rallied rapidly from the operation.

The wound on the right side was dressed daily with a moist boric dressing, while the left ear was carefully cleansed with a boric solution, although no more pus appeared and the cavity seemed to be in the same thoroughly clean condition as before.

The temperature until *October 9th* ranged between 98° and 99°. On this day it went to 100°, but dropped again after thorough cleansing of the drainage tube. The stiffness and pain in the

neck at this time had greatly decreased, and the nights were quiet and restful. On October 12th, the temperature again rose to 100°, and until the 17th ranged between 98° and 100°, when it again dropped to a daily range of 98° to 99°. This last rise of temperature was due to the development of a deep swelling on the *left side* of the neck, corresponding to the site of the drainage opening on the right side, about the region of the occipital artery, which, on October 16th, was opened, under local anæsthesia, and drained of a considerable quantity of pus, of the same character as that obtained on the opposite side.

At this period the patient's general condition, with the exception of loss of weight, was greatly improved. Granulation progressed steadily in the right ear (Schwartz), the large wound cavity having practically closed, and gave no further trouble. The *left ear* (Stacke-Schwartz) still showed a small bead of pus on the floor of the tympanic cavity, the wound otherwise having become covered with epidermis. The most recent wound in the neck (beneath the left side of the occiput) drained copiously at first, but the flow gradually diminished. From this time until November 7th the temperature remained normal. On November 10th it rose to 100.8°, and on the following day the patient again complained of considerable deep-seated pain on the *left side* of neck, and inability to rotate the head. On November 13th, after a restless night, swelling was noticed over the left occipital region, extending almost to the site of the mastoid scar and down the back of the neck, and he was again placed on the table. Under ether anæsthesia, a free vertical incision three inches long was made along the course of the drainage sinus, down to the base of the occipital bone. Careful exploration, almost to the left condyle, opened up a pocket of pus, under the periosteum, which extended laterally to the region of the partially obliterated digastric fossa of the temporal bone, one recess of this pocket going up on the occipital bone to the middle of the lambdoidal suture. The manipulation of this pocket again forced pus into the left (Stacke-Schwartz) ear, so that it was necessary to reopen the ear cavity by a second clean incision parallel to the old scar behind the ear. After careful exploration, the only spot found to be at fault was the small area of granulation around an opening in the floor, which admitted a small probe downward into the subcranial tissues. All the denuded occipital bone was thoroughly curetted. In the light of past trouble in this case it was

deemed best to leave both wounds widely open, and they were solidly packed with iodoform gauze, the suboccipital opening being reinforced with a drain. After the first dressing, which seemed by the complete absence of pus to indicate a thorough result, the mastoid wound was closed by a pressure dressing and rapidly healed without any further set-back. The suboccipital wound was allowed to heal by granulation. The subsequent history of this case is uninteresting, recovery from this time forward being uninterrupted. The temperature, which up to November 22d had ranged from 98° to 100°, dropped to normal and remained so. The patient was discharged December 20th cured, but is still kept under monthly observation.

In conclusion it may be well to emphasize the three peculiar features of this case:

First: The complete absence of any of the classic symptoms or physical signs of mastoid involvement on the right side, as has been pointed out.

Second: The involvement of the adjacent suboccipital region, without previous development of any intracranial lesion—a remarkable condition considering the amount of destruction of the inner table on both sides.

Third: The remarkable migration of pus beneath the occipital bone from one temporal region to the other. The line of communication was probably under the periosteum posterior to the os magnum and beneath the occipital attachment of the deep muscles of the back of the neck.

The case is undoubtedly of the class known as Bezold's mastoiditis, but differs from the usual form, in that it travelled laterally along the under side of the occipital bone *beneath the periosteum*, parallel with the muscular insertion, and did not appear on the surface behind the mastoid apophysis.

ELECTROLYSIS IN THE TREATMENT OF CHRONIC EUSTACHIAN STENOSIS.¹

By FRANK T. HOPKINS, M.D., NEW YORK.

THE use of electrolysis in the treatment of chronic stenosis of the Eustachian tube is a method well known to all otologists and has its advocates and its opponents. I need not therefore take your time by reviewing the subject or by going into all the detail of method which has already been carefully presented to you during the last few years. I wish now to consider merely some essentials of technique which are occasionally overlooked, and to offer, as the result of a considerable experience, a suggestion in the use of the bougie which may give better results in certain severe cases. Electrolysis, rightly employed, can be of great benefit in the treatment of chronic catarrhal stenosis of the Eustachian tube, and therefore is an important factor in curing those cases of deafness and tinnitus which are dependent upon this pathological condition.

The symptoms which bring the patient to us are deafness and tinnitus, which may occur separately or in combinations of varying degrees of severity and persistence. Sometimes the tinnitus is apparently the important symptom—so much so, indeed, that the deafness may be overlooked by the patient, and only discovered after the usual tests have been made. Again, however, deafness is the prominent symptom, while tinnitus is so slight and so infrequent that it does

¹ Read before the Section on Otology of the New York Academy of Medicine October, 1905.

not cause the patient any especial discomfort. And further, in other cases we may have tinnitus and deafness coexistent and equally severe and annoying.

Since, however, both deafness and tinnitus may exist in the same degree, without any stenosis of the tube, it is necessary at the outset to learn whether stenosis is present, its character and degree, and, if possible, to what extent the symptoms are dependent upon the stenosis. The existence of stenosis is easily determined by the use of the Eustachian catheter. Setting aside those obstructions to inflation which are due simply to the accumulation of more or less viscid fluid in the tube or about its pharyngeal opening, we shall find, in general, that inability to inflate the middle ear is due to stenosis of the Eustachian tube,—a stenosis which may be either hypertrophic—that is, œdematous in character—or hyperplastic. Simple inflation will generally relieve, and may eventually cure, hypertrophic stenosis; but if the narrowing be very great, or if there occur at points along the tube deposits of new connective tissue, constituting a hyperplastic inflammation, then inflation will not be successful, and no amount of repeated inflations will overcome the narrowing of the tube.

In such an event, then, dilatation offers the natural relief for the stenosis. If the narrowing be slight and the resistance be not severe, a cotton dilator or a bougie may be used with some advantage, although the patient will suffer severe pain through its use. If, however, the stenosis be very great, a cotton dilator is out of the question, and a bougie is unbearably painful, and often impossible to pass; or, if passed, the force necessary to accomplish this is more than likely to produce abrasions of the mucous membrane. And further, even if dilatation is accomplished without injury to the mucous membrane, the result is not as lasting as it is under electrolysis, and the constant repetition which is necessary renders the patient again and again liable to these injuries. It is here that electrolysis is of great advantage, enabling us easily, and with far less pain, to pass through the lesser degrees of stenosis; and without great difficulty and with no injury to the lining membrane of the

tube, to pass through the very narrowest strictures. We do not say that in these severer cases the first application of electrolysis is painless, but it is reasonable to believe that the pain which may be excessive without electricity will be much less severe where the action of the electric current is used to relieve the congestion and œdema; and at every subsequent application it will, as a rule, be found that there is less and less pain and less resistance, so that the obstruction which will at first scarcely permit a number one (French) bougie to pass through, will afterwards easily and almost painlessly allow the passage of larger bougies.

What then are the objections to the use of electrolysis? Apparently the chief objections are based on a fear of certain dangers which attend the operation. But while it cannot be said that these dangers are imaginary, we do claim that they are greatly exaggerated, and that the fear of them is largely due to unfortunate experiences which have resulted from the faulty methods employed by inexperienced operators. Indeed, these objections seem to be the usual objections which any new method encounters, namely, the haste of careless or ill-advised operators to take up that which is new, and the reaction in sentiment which naturally follows their failures.

Amongst the causes of failure one, perhaps less common now than formerly, is the disregard of the diseased condition of the naso-pharynx. Without careful attention to these parts it is almost useless to try to benefit the tube, for the catarrhal condition of the tube is usually but an extension of the same morbid process from the naso-pharynx; and while the latter disease continues unchecked, the tube cannot be permanently benefited. It is, therefore, necessary to remove all adenoid vegetations, especially those about the pharyngeal opening of the tube, and to make sure that any cause of obstruction, such as spurs, polypi, or enlarged turbinates, are given proper treatment, in order that the chronic catarrhal condition of the naso-pharynx shall be reduced to the minimum.

We may now pass to a consideration of those errors which are the result of faulty methods. Of these errors the lack

of aseptic care is one of the most important. Considering how many conditions are necessarily present which must militate against asepsis, we should be the more careful to render all our work as aseptic as possible, not alone in sterilizing our instruments, but also in cleansing the nasal cavity; and finally, by a preliminary inflation of the tube, relieve it of the mucus and pus which may be lodged in it. These are the important preliminary steps, and I do not believe, if these things are carefully attended to, that inflammations, abscesses, or other septic conditions will occur to discredit the operation or to discourage the surgeon.

Care regarding the electric current is another important matter, both as to its polarity and as to its strength. Now, while it goes without saying that the bougie should be attached to the negative pole, yet it seems more than likely that this precaution has been neglected in those cases where the bougie has broken off in the Eustachian canal. Nor should the surgeon leave this all-important matter to conjecture, but he should make it his habit every time to look and see that the pole is rightly placed. The action of the current should be tested before using, and the current must be turned off before the bougie is introduced into the catheter, and after its use it must be turned off again just before the bougie is withdrawn from the catheter.¹

The utmost gentleness should be exercised in passing the bougie into the canal. If the surgeon from lack of experience has not the sense of touch which enables one to know when the bougie is really in the tube, he may wisely begin by determining the proper position of the catheter by a preliminary inflation, and then, still holding the catheter firmly in place, let him introduce the bougie through the catheter, when it must necessarily pass from the catheter into the tube. But after the bougie has once been used, whether successfully or unsuccessfully, inflation must not again be employed at that sitting, whether for the purpose of locating the position of the tube or for testing the clearness of the tube after the passage of the bougie; for such an in-

¹ But while the bougie is in the Eustachian canal the current must be continued.

flation is very liable to cause subcutaneous emphysema,—always a disagreeable, and sometimes a very serious accident. If by ill-chance the bougie has not entered the Eustachian canal, but has made a false passage, and blood is found on the bougie upon its withdrawal, it is well to make an application of nitrate of silver, an 8 per cent. solution, in the region of the mouth of the tube as a precaution against septic infection.

When, however, all has gone well, and the bougie is in the canal, the current should be turned on slowly. For this operation we find that forty volts will best overcome resistance, while from two to five milliamperes will give sufficient intensity. The passage of the bougie through the Eustachian canal should be made slowly and carefully, with not more than one milliampere of current until the point of obstruction is reached; then the current may be increased to two or three milliamperes—rarely to five—and the bougie advanced with firm and steady pressure until the stricture is passed, while the middle or the ring finger is held against the catheter to prevent a sudden advance of the bougie in case the stricture gives way unexpectedly soon. Then with the same slow motion, if no other obstruction be encountered, push the bougie on until it begins to enter the middle ear. Here, of course, it should stop; although, if the motion has been slow and guarded, it will not cause injury even if it impinges on the posterior wall or comes in contact with the tympanic membrane.

As it is not always possible by mere sense of touch to appreciate the precise moment of the passage of the bougie out from the Eustachian canal into the cavity of the middle ear, I wish to call your attention to a fact noted by my colleague, Dr. Kenefick, namely, that the patient himself will indicate this moment by an involuntary and peculiar expression of countenance which Dr. Kenefick has called the "tympanic expression," and this may always be observed when for the first time the bougie enters the tympanic cavity. On the other hand, the absence of this expression should indicate that the bougie has not been carried entirely through the Eustachian tube.

We come now to what I consider and claim to be the all-important part of this method of treatment, namely, the degree of dilatation to be employed. Beginning always with the smallest bougie, which is No. 1 (French) (that is, one third millimetre in circumference), we may, from time to time, at varying intervals, use other and larger bougies, Nos. 2, 3, and even 4 (French), according to the conditions of the case. As far as my own experience has led me to judge, I regard it as a mistake to rest satisfied with the dilatation accomplished by a No. 1 bougie, for in many such cases contraction inevitably occurs later. I believe in wide dilatation. Accordingly, it is my custom to begin with a No. 1 (French) bougie, using it at intervals until it is very easily passed, and then to use a No. 2 bougie in the same way, and finally a No. 3. The bougie is used at intervals of two weeks to four weeks, according to the effect which is produced on tinnitus or deafness, and according to the amount of inflation obtained. After three months or more the next larger bougie is employed.

Meanwhile a nasal spray, varying in character with the different cases, is made use of by the patient, and two or three times a week inflation is given, generally with a medicated vapor. Always bear in mind the importance of inflation, and do not neglect it. Remember that the dilatation of the canal is not the final object of our treatment, but that dilatation is employed only as a means by which the cure of the catarrhal disease may be successfully accomplished. For such a success, however, we must rely upon perfect and repeated inflation.

Of course the harder, firmer strictures, and especially the tubular strictures, will require a longer time for successful dilatation, and in these cases it will be found more difficult to pass from a smaller to a larger bougie. In these cases, also, there is always a greater inclination to subsequent contraction, so that it becomes necessary, after dilatation with the largest bougie appears to be satisfactory, to repeat the electrolysis regularly every six or eight months. In my own practice I have had a few cases in which little or no improvement was obtained in tinnitus or in hearing with the

passage of a No. 1 bougie, although the inflation was better, but which improved decidedly after the larger bougies were passed. And many cases prove that the increase in hearing and the lessening of tinnitus is proportional to the degree of dilatation.

UNTRANSLATED ARTICLES FROM VOL. XLII.,
"ZEITSCHRIFT FÜR OHRENHEILKUNDE."

ABRIDGED TRANSLATION, BY ADOLPH O. PFINGST, M.D.,
LOUISVILLE, KY.

A TROPICAL AFFECTION OF THE EARS.

By RICHARD MUELLER, Berlin.

TWELVE or more cases of a disease which seems to be peculiar to tropical regions were observed by the author. The disease, which occurred in patients between the ages of twenty-three and forty-five, and which in all but three instances affected both ears, was characterized by the insidiousness of its onset, a gradual loss of hearing being its most marked subjective symptom. Along with this there was a feeling of fulness in the affected ear, a gradual development of subjective noises, and the formation of a boggy swelling of the soft parts of the meatus. This swelling, in a few cases, gradually subsided without having greatly inconvenienced the patient, but in the majority of the cases the swelling was accompanied by severe pain in the ear lasting from several hours to several weeks or months. Elevation of temperature was noted in only one of the cases. This painful stage was always followed by a long chronic stage, during which permanent pathological changes developed. They consisted in the formation of exostoses and marked hyperostosis of the bony wall of the auditory canal. The enlargements were all single, multiple exostoses not having been observed. The bony growths were found on every wall of the canal except the superior, and varied considerably in size, the largest extending about two-thirds across

the lumen of the meatus. The skin over the growths was always more or less hyperæmic. Deafness and subjective noises on the affected side were always complained of. The character of the noises differed, being variously compared to the blowing of air, the rushing of water, ringing of bells, etc. The defect in hearing also varied, one patient being able to hear the whispered voice only when spoken very close to the ear, while in some it could be heard at 4 metres or more. With the reduction of perception for speech, a proportionate fall in the upper limit for notes was also observed. Dizziness was never complained of.

As only three of the cases were given treatment, the author was not able to determine the effect of therapeutic measures on the course of the disease. In every instance spontaneous improvement was noticed with the return of the patient to his former home or with removal from the unfavorable climatic environments, and a final complete recovery of function and disappearance of the subjective noises.

Conditions similar to those found by the author have previously been observed by other practitioners in the tropics. Plehn described a condition seen by him in Europeans residing in the tropics, characterized by pain in the ear of five to eight days' duration, along with swelling in the ear canal which almost occluded the meatus. He reported a complete restoration of the function and return of the parts to normal. Riege and several other naval and army surgeons, who observed identical cases in San Domingo and the West Indies, also reported complete recovery. None of the patients in whom the disease was observed gave the history of former ear trouble. In those cases in which permanent bone changes develop, long-continued or permanent subjective noises were the rule. It seems probable that with the hyperæmic condition of the meatus an associated hyperæmia of the labyrinth may exist, which would account for the tinnitus. The possibility of inflammatory changes in the labyrinth should, however, also be considered.

Based upon his own observations and the observation of others, the author suggests a division of the cases into: A.

Mild cases, in which there is only a slight diffuse inflammation of the skin of the meatus and which terminate in complete recovery; B. *Cases of medium severity*, in which the periosteum is involved in the inflammatory process with resulting permanent bone formation, but in which the defect in hearing and subjective noises last only a short while after the inflammatory stage of the disease; and C. *Severe cases*, in which the bone formation is extensive and permanent, and in which the disturbed function and subjective noises, probably the result of labyrinth changes, persist for a long time after the disease in the meatus has run its course.

TRAUMATIC ATRESIA OF THE AUDITORY CANAL.

By Dr. RUDOLPHY, Breslau.

Twelve cases of traumatic atresia of the ear canal, all that could be found in literature, are briefly reviewed by Rudolphy, and an additional case from his own practice is reported more in detail. The cases nearly all resulted from burns, injuries by strong acids and alkalis, or by ulceration in the canal secondary to long-continued otorrhœa. It has been a common observation that extensive laceration of the auricle and ear canal, even to complete destruction of the auricle, is not frequently followed by atresia of the canal. On the other hand, two of the reported cases of atresia followed only a partial separation of the auricle from its attachments.

The author's case of traumatic atresia occurred in a man who was kicked on the chin by a mule, with a resulting compound fracture of the inferior maxilla and injury to both ear canals. Examination soon after receipt of the injury revealed a swelling on the floor of the right meatus, about 3 to 4mm from the drum, from which blood was exuding. The left ear canal was found full of clotted blood and was extremely sensitive to pressure. The canal was irrigated at once with a sublimate solution and packed with gauze. It took about two weeks for the blood to clear away sufficiently to recognize the fractured area. It could then be seen as an elevated open area very much as though a nail had been driven through the bone. Two weeks later con-

siderable scar tissue had formed over the prominence, so that a small slit along the upper and posterior wall of the canal was all that was left of the lumen of the canal. Hearing was normal. The lumen continued to grow smaller, so that two months after the injury a probe could be passed with difficulty through the stricture. Hearing had been reduced to almost total deafness; however, sounds from a tuning-fork at the vertex were most readily perceived on the affected side. When this patient was seen about eight months later, an hour-glass constriction, at the depth of about $1\frac{1}{2}$ cm., completely occluded the left meatus, so that a probe could not be passed. The constricted portion seemed rather soft and was covered with epithelium.

A fracture of the anterior wall of the ear canal had evidently resulted in this case and the cartilaginous canal been torn from its bony attachment. The sound-perceiving apparatus had apparently not been injured. The case demonstrates the advisability in such accidents of avoiding infection of the meatus, and of endeavoring to prevent atresia by immediately replacing displaced fragments of bone, and keeping them in position with a firm cotton tampon, gauze making insufficient pressure. After a stricture has begun to be established, a tampon, or even the wearing of a canula for several months, will not prevent an increase in the swelling and consequent atresia of the canal. Ostmann has employed electrolysis at intervals of eight to ten days with good results in non-traumatic atresia of the meatus. He believes that the current prevents the formation of scar tissue or at least lessens it. In most cases surgical measures have to be resorted to. The most satisfactory method of removing the obstructing tissue after it has formed is the one suggested by Koerner. An incision is made behind the auricle, the cartilaginous canal severed from its surroundings, and any osseous constriction removed by means of chisel and hammer. A flap is made in the membranous canal posteriorly and the canal tightly tamponed. Jansen has modified this operation by making one flap backward from over the mastoid for the posterior wall, and another from the posterior surface of the concha for the anterior

wall. He reports two cases operated upon by this method with good results. Operative interference is imperative in all cases of atresia accompanied by otorrhœa, and is justifiable in cases where the atresia interferes with the conduction of sounds through the natural channels when a good perceptive organ can be demonstrated by acuteness of perception through the bone.

THE POSITION OF THE MANUBRIUM IN THE NORMAL DRUM.

By Dr. BRUNZLOW, Rostock.

Steinbruegge is given credit by the author for having been the first to point out the asymmetry of the two drums in the human. C. Hasse subsequently examined the drums in a large number of subjects with reference to the position of the malleus, and found that it nearly always appeared more horizontal on the left than on the right side, and that the light reflex on the right drum was directed downward and forward, while on the left side it pointed almost directly downward. This asymmetry although also noted in children was not so apparent at that time of life as in the adult. Hasse found among a hundred soldiers that the left malleus was unmistakably more horizontal than the right in every case, and even in those cases where both drums were retracted the left malleus showed the most inclination toward the horizontal. The examination of a large number of ossicles by R. Bloch shows that the angle formed by the union of the body and the long process of the malleus was always more obtuse on the right side than on the left.

To note the difference in the position of the manubrium, the author divided the outer or larger end of an aural speculum into nine equal segments, with very fine wire radiating from the centre or crossing point and attached at the edge of the speculum. As the zygomatic arch is believed to correspond to the horizontal meridian of the erect skull, this is chosen as the landmark for the author's measurements. With a little practice the horizontal intersection of the speculum can be placed parallel to the zygomatic arch, and then by getting the point of decussation of the wires over

the umbo the difference in the position of the handle of the malleus can be determined. Of almost 300 drums examined, almost equally divided between the left and right side, an angle of 40° to 50° was noted between the manubrium and the horizontal meridian. The average for the left side was 45° , while for the right side it was 51.6° . Of 149 cases in which both ears were examined, the angle was found to be identical on the two sides 73 times, largest on the left side 24 times, and largest on the right side 52 times. The usual difference between the two sides was from 5° to 10° . At present the author can see little advantage in this anatomical observation for the recognition of pathological conditions, but believes that it is well to take in account the tendency for the left manubrium to incline toward the horizontal in the examination of all drums.

CEREBELLAR ABSCESS AND SINUS THROMBOSIS.

By Dr. Voss, Riga.

A man of thirty-one years, who had received a blow on the right ear ten years previously, complained suddenly of severe pain on the right side of the head. He felt bad generally and vomited several times soon after beginning of the pain. There were also some convulsive movements and weakness of the lower extremity. No vomiting. Sensorium clear. Fundus of both eyes normal. No earache but a discharge of foul pus from the right ear. No mastoid tenderness. Pulse 64 and regular. Temperature 37° C.

The radical mastoid operation was undertaken soon after the patient was admitted to the hospital. The mastoid bone was sclerosed and contained a very small antrum which was filled with a cholesteatomatous mass. The dura of the middle cranial fossa was exposed and several exploratory punctures made into the temporal lobe in different directions without finding pus.

Following the operation the patient apparently improved, the pain leaving him for four days, the appetite returning, and the general appearance of the patient improving. The temperature however remained below 37° C. while the pulse

rose to 78 and remained irregular. On the fourth day after the operation, some œdema of right upper eyelid was noticed, and two days later the pains in the right side returned. The patient grew weaker and listless. Pulse 60 but regular. The pain continued to increase in severity and on the following two days the patient vomited frequently, the pulse rising from 68 to 72 and becoming irregular. The patient still complained of no dizziness but of much weakness of the lower extremity. He had a staggering gait. Vomiting became more frequent, and when examined six days after the radical operation a marked optic neuritis and swelling of the optic disk were present. The old wound was reopened, the incision extended posteriorly, and the cerebellum and the lateral sinus exposed. The dura seemed to be in a normal condition. The sinus wall, although apparently thick, was not distended. It was not pulsating. Upon incising the sinus it was found to be filled with a large thrombus. Incision of the cerebellum liberated two tablespoonfuls of thick, foul pus. By using the finger, inserted into the abscess cavity, as a guide, a counter opening was made posteriorly to the sinus. The cavity was tamponed. After this operation the patient was again considerably improved, the headache disappearing, and the pulse becoming more rapid although remaining irregular. Constipation was still marked. The tampon was removed for the first time on the fifth day after the operation. Ten days later the abscess cavity had closed, the appetite had returned, the bowels moved daily, and the general condition was good. The pulse was still subject to variation, varying at different times from 64 to 92. The temperature was 36.9° C.

About four weeks after the last operation, the optic neuritis on the right side had disappeared but the edges of the disk were still somewhat blurred. Optic neuritis was still present on the left side. When the patient was discharged some time after this he was able to walk naturally without any difficulty. His pulse was 80, but still lost one beat every one and a half to two minutes.

The feature of this case was the apparent improvement following the first operation, which was probably the result of

opening the cranial fossa. Real improvement did not follow until after the second operation, made six days after the first exploration. After the second operation, the pulse rose from 60 to 78, and the patient expressed himself as feeling perfectly well, with the exception of the persistent constipation. The brief period of apparent improvement noticed after the first operation was followed by more severe headache, frequent vomiting, tottering gait, slowing of the pulse, and the appearance of a double optic neuritis. The temperature continued slightly elevated after the first operation. This symptom-complex indicated cerebellar involvement and the necessity of another operation. The only symptom denoting sinus thrombosis was the transitory swelling of the right upper lid. The optic neuritis was indicative of either of the two existing conditions.

ABSCESS OF THE TEMPORAL LOBE.

By Dr. ALBERT BLAU, Goerlitz.

A boy of eighteen, with a history of otorrhœa on the right side during childhood, applied for treatment on account of a foul discharge from the right ear. Examination revealed a large perforation in the right drum, occupying the lower half of its area. The malleus had lost its long process and felt rough on contact with a probe. The mucous membrane of the tympanic cavity was covered with granulation tissue. This was removed with a curette and the operation followed up by consistent irrigation and cauterization. As this treatment was of no avail and the granulation tissue continued to increase, the radical mastoid operation was advised but refused. In the course of a year the tympanum was curetted a second time, and later, about eleven months after the beginning of the treatment, the ossicles were removed. Notwithstanding all this the condition remained unimproved.

About a year after the patient began treatment, the radical operation was finally consented to. The antrum was found full of pus and granulation tissue and its bony walls as well as the tegmen were carious and soft. The carious tissue was

removed, thereby exposing the dura, which was apparently normal and showed no pulsation. As the carious bone extended backward, its removal also laid bare the sinus, which appeared normal. The operation was completed with Koerner's plastic.

The healing process took a normal course until the fifth day, when the patient began to complain of a feeling of pressure and pain in the right temple and eye and the right eye began to secrete tears freely. These symptoms became worse and by the next day there was considerable photophobia. The right pupil was slightly dilated. The fundi were normal. Temperature 37.6° C. Pulse 66 to 78.

Three days later the patient began to vomit, and the first symptoms of an affected sensorium showed themselves. Although the patient answered questions rationally, his mind seemed sluggish and his speech slow. On that same evening he suddenly became very restless and in half an hour lost consciousness. Both pupils were dilated, muscular twitching was noticed on the left side, and the pulse had increased from 140-160. The patient was given an enema, which was effectual. Soon afterwards he recovered consciousness, and the pupillary reaction to light returned, although the right pupil still remained somewhat wider than the left. Pulse 90. The sudden change for the worse and the subsequent improvement all took place within three and a half hours. On the following morning the general condition of the patient was apparently much improved. He had no headache and very little lachrymation. However, the tendon reflexes, especially the patellar reflex, were very much exaggerated, and the pulse was unusually slow, ranging from 58 to 66. Temperature 36.9° to 37.3° C.

More bone was removed and an area of dura about the size of a dime exposed. The dura was hyperæmic but non-pulsating. After this the wound was dressed daily.

The hyperæmia of the dura continued to increase until two weeks after the operation it had become tense and very much discolored. The patient at that time again complained severely of headache and lachrymation on the right side. The dura was freely incised and three tablespoonfuls of

yellowish-green pus liberated. The pulse, which before this operation had been 57, rose to 72 during the operation and the headache and lachrymation ceased. Temperature 36.7° to 37° C. The wound was dressed again on the afternoon of the same day and about two more tablespoonfuls of pus evacuated. The brain substance surrounding the deep pus cavity was soft and discolored. Pus continued to discharge freely for several days after opening of the abscess.

A month later it was still discharging slightly; the pulse ranged from 90 to 100; temperature 37.3° C. The wound was again extended backward and sufficient bone removed to expose an area of dura as large as a half dollar. The dura was split as far as the edge of the bone. This large opening allowed the softened brain substance gradually to exfoliate. The pus discharge subsided and the wound began to granulate. Two months later the wound had closed and the patient was apparently in perfect health.

The manifest stage of brain abscess in this case was characterized by headache, supraorbital neuralgia, lachrymation, dilated pupils, vomiting, lethargy, and later by loss of consciousness, wide rigid pupils, twitching of the muscles of the face and left leg, increased patellar reflex, and slow pulse. Before the manifest stage the only symptoms to indicate brain involvement were the depressed condition of the patient and his general unhealthy appearance, although the carious condition of the tegmen and the absence of pulsation and lustreless condition of the dura were suggestive of dural inflammation.

The brain infection and subsequent abscess formation in the temporal lobe in this case in all probability took place through the tegmen where the bone was carious to the dura. The dura at first showed no evidence of brain abscess, but later bulged as though about to rupture. Its marked thickness was suggestive of an inflammatory condition of long standing. It is difficult to conceive of the infection extending through the dura without breaking down of the membrane, and the only satisfactory explanation of the infection is an extension by means of the lymphatics and blood-vessels.

REPORT OF THE FOURTEENTH ANNUAL MEET-
ING OF THE GERMAN OTOLOGICAL SOCIETY
IN HAMBURG, JUNE 9 AND 10, 1905.

BY DR. VON GAESSLER, ERLANGEN.

Translated by Dr. ARNOLD KNAPP.

The presiding officer, Dr. KRETSCHMANN, welcomed the assembly and spoke of the five members who had died during the past year. The Secretary reported that the Society now numbered 337 members. The publication of a second number of *The Anatomy of Deafmutism* was announced. It consisted of a monograph by Dr. Alexander of Vienna, with forty-five illustrations on nine plates. The next annual meeting will be held in Vienna, and Dr. Hartmann of Berlin will be the presiding officer.

I. DR. HARTMANN (Berlin). **The hard of hearing in the schools.**

Owing to the better care which is now being taken in Germany of the deaf-mutes by special deaf instruction, a constantly growing number of deaf-mutes can undertake certain callings. While in Prussia in the year 1880 only 43.6 per cent. of the adult deaf-mutes were active in a profession, the number had increased to 70.2 per cent in 1900. These figures show the social as well as the economic importance of the instruction of deaf-mutes. This has obtained a distinct and new importance on account of the investigations of Bezold, who has shown that many deaf-mutes retain hearing remnants and can thus be instructed by a special form of instruction in order to learn and make use of speech. In a similar position to the deaf-mute is the very deaf. The greater the deafness, the more is the mental development re-

tarded, and consequently the poorer is the social position of the deaf person. Experience has shown that very deaf children remain for years in the lowest classes, or they are finally transported to the classes for the weak-minded as they are regarded as such.

The number of ear patients among school children has been demonstrated by systematic examination of the schools, and it has been shown that in one quarter of the children in the schools the hearing organ is not normal. The relation of the various causes for deafness is not the same according to all investigators. In general, Eustachian-tube infections constitute 50 per cent. Moreover, according to Bezold, 1 per cent. of the children possess suppurating ears and the same proportion possess dry perforations. These experiences gained from the examination of the school children have also been demonstrated in the examinations for military service. In Prussia in the year 1903, 10.7 per thousand could not be admitted to military service on account of an ear trouble. Of great importance is the fact that in very many deaf children the deafness varies greatly, which is generally the case with stenosis of the tubes in conjunction with diseases of the naso-pharynx. This condition may produce a suspicion of simulation on the part of the child and thus lead to incorrect judgment.

The hearing examinations are now made, according to Bezold's suggestion, entirely with the whisper voice, in which only the residual ear is used and the numbers from 1 to 99 are spoken. The ear not examined is turned away from the examiner and closed with the index finger. To determine to what degree of deafness the children in the schools belong, or whether they cannot be admitted to the ordinary classes, the grades of deafness have been classified according to Bezold and Denker. They found that 75 per cent. of the ears examined heard whisper in more than 8 metres, 8.9 per cent. in less than 4 metres, 5 per cent. in less than 2 metres, 3.5 per cent. in less than 1, and 2.2 per cent. in less than $\frac{1}{2}$. Very frequently deaf children are regarded as weak-minded. For instance, the teacher in a class for deaf children considered 4 as weak-minded among the 12 deaf children. These upon proper instruction were shown to possess perfectly normal mental development. A series of examinations of hearing which were made in classes for weak-minded children showed that among these there was a large

proportion of more or less deaf ones who improved very much after their deafness had been recognized and proper instruction had been instituted.

As the number of deaf among 100 school children has proved to be between 4 and 5 who can hear a whisper voice only at a distance of 2 metres, and can therefore not follow the instruction, it is necessary that a school physician should act in conjunction with the teacher, and examine the hearing power of all children. Special regard should be paid to whether the cause of the deafness can be cured, and proper means should be undertaken that the condition may be treated. The experience of all investigators has shown that an appropriate treatment in 50 per cent. of the deaf children has cured or very much improved the trouble. It is the duty of communities that the deaf should receive proper treatment. Of those children who are incurably deaf, their remaining in the schools depends upon whether they can follow the instruction. In addition to the absolute degree of the deafness, the intelligence of the child and the supplementary aid on the part of the teacher from the parents play an important rôle. Association with normal children is of great importance for deaf children. Bezold demands a hearing power of 2 metres for the whisper voice for those desiring to visit a school, though the instruction may be undertaken even in those with poorer hearing.

In Berlin, among 23,000 school children, 45 deaf children were selected. Of these, 30 were divided into three classes for deaf children. These were instructed by three teachers in two departments. The inmates were principally children who could hear a whisper voice in less than half a metre. The better hearing ones remained in the public schools. The establishment of separate classes for deaf children is to be recommended in cities of 150,000 to 200,000 inhabitants. The main point in the instruction consists in the cultivation of speech and the understanding for speech. In lip reading and in general, the plan of the public schools is the one which is to be followed. Even children who have good hearing remnants and have not been able to learn speech can be admitted to these classes.

In the higher grades of deafness where whisper cannot be heard and conversational speech is only heard in the neighborhood of the ear, the instruction is that for deaf-mutes with hearing remnants.

Conclusions.

1. The deaf children are to be determined by hearing examination of all the children. This examination may be conducted by the teacher if he has been properly instructed.

2. It is desirable that the deaf children should be examined by a competent physician and if possible the deafness should be treated.

3. Selection of a seat in the neighborhood of the teacher.

4. The better hearing ear should be directed to the teacher.

5. Special attention must be paid to whether the deaf child is following the instruction.

6. Mistakes due to imperfect hearing should be properly recognized.

7. Each deaf child should be seated with a wide-awake intelligent scholar who can supplement the instruction.

8. The other children and the parents should be asked to talk as much as possible with the deaf, and endeavor to make them join as much as possible in the conversation,

9. If the work in the school is difficult, help should be furnished by additional hours.

10. In high grades of deafness where a whisper voice can only be heard in a distance of from 1 to $\frac{1}{2}$ m or less, individual instruction should be practised, or special classes for deaf children should be formed, which should contain from ten to fifteen children.

11. If the very deaf children cannot be individually instructed or receive instruction in classes for the deaf, they should be admitted to the school for deaf-mutes. This institution should be formed after the pattern of that in Munich.

2. Dr. PASSOW. **On school instruction for deaf-mutes.**

The speaker had been requested by the Prussian Government to report on the results of the hearing instruction of deaf-mutes. The instruction of deaf-mutes from the ear has been quite successful. This is shown by the literature of the deaf-mute teachers and witnessed by all those who have been interested in this subject. The instruction, however, is probably given only in Munich and in Heidelberg. In general, children who were instructed in classes with the usual methods of instructing deaf-mutes received separate instruction from the ear in additional hours. A thorough reform is here required. The formation of

hearing classes in the various deaf-mute institutions is associated with difficulties, because scholars of various ages and degrees of intellect must be grouped together, but a separation of the partially-hearing from the totally-deaf must be carried out. Special institutions should be formed to admit the partially-hearing, in which they will be instructed in speech from the ear. The chief difficulty consists in the selection of proper scholars. In addition to these schools, the old deaf-mute academies can continue, but should receive only the totally-deaf. In this separation of the totally deaf, the gesticulation can be controlled and a uniform method of speaking should result. The true deaf-mute cannot obtain any practical advantage from speech which is uncomfortable for him and which is difficult for those surrounding him to understand. He therefore prefers to use the sign speech. These persons only associate with one another by means of this form of speech. Hence in the totally-deaf the sign language cannot be given up but should be cultivated. It is desirable that in all institutions a similar and uniform sign language should be introduced, and it is desirable that every deaf-mute teacher should understand it thoroughly. Finally, it would be well to introduce obligatory school attendance for deaf-mutes.

Discussion.—Dr. DENKER stated that from his own experience he was in favor of getting the aid of the teacher in making the examinations of school children. If they have been previously thoroughly instructed their examinations are sufficiently reliable.

KÜMMEL is in favor of proper schools for deaf-mutes, with instruction in the sign language, in which the children may remain for one year. After that they should be separated according to their hearing power and their mental equipment. Those who cannot be instructed by the ear should depend upon the sign language, also those who are very weak mentally. The more intelligent children should later learn speech.

WANNER objects to the form of hearing instruction, and suggests instruction from the ear. The establishment of special institutions for the partially-hearing would be very desirable. In Munich, out of 500,000 inhabitants, there are 52,000 school children, for whom the School Commission has appointed ten aurists. One of these determines the extremely-deaf, and ten to fifteen classes are necessary for these.

LAUBI suggests that a commission be appointed in order to institute uniform school examinations.

KÖHLING, a teacher of deaf-mutes, reported on the establishment of a hearing class in Weissenfels. He is opposed to the idea of the greater importance of the sign language and regards it as a step backwards.

GUTZMANN is of this opinion, and knows totally deaf persons who have retained the power of speaking after their school days and can make themselves understood very well.

BRUEHL also spoke of deaf-mutes who in later life could make use of the speech which they had learned in school.

HARTMANN, in conclusion, again wishes to distinguish between classes for deaf children and classes for deaf-mutes with hearing remnants. He is also in favor that a commission be appointed.

PASSOW replied that he had only recommended that the question of the instruction of deaf-mutes should be examined more closely. He is not at all of the opinion that the sign language should take the place of speech. On the contrary, the sign language should go together with the instruction by speech.

3. Dr. DENKER. Which elements can we neglect in learning the human speech?

Clinical observations have shown that, in order to learn to speak, the entire complicated apparatus of the human ear is not necessary. The auricle can be missing, the ear canal can be occluded, the drum, hammer, and anvil, and even the inner muscles of the ear may be destroyed if the stapedial plate is preserved and can vibrate. In regard to the inner ear, we may conclude from the examination of deaf-mutes that the terminal distribution of the vestibular and ampullary nerves has only a secondary importance for hearing. To the other question, as to the elements in the complicated terminal apparatus of the cochlear nerve, which corresponds to the highly developed Corti's organ of man and of the mammals, a satisfactory answer cannot at present be given from our present knowledge of the histological examination of the normal and pathological temporal bone of man. We may, however, draw certain deductions from comparative anatomy. We possess in the parrot an animal of whom we are certain that it understands the human speech, because it can repeat it, and whose hearing organ is placed upon a lower scale than the mammalian ear. The ear of the parrot has been examined by wax and metallic corrosion models in various series, and a large wax model has been made by Dr. Gaessler. These

ears belong to animals who could at least pronounce several words. These results show certain points of similarity with conditions found in the human ear :

1. In place of the ossicular chain of man, there is a bony pillar, the columella, which protects the drum membrane externally and is attached with a foot-plate in the vestibular window.

2. There are no intratympanic muscles which approach the columella.

3. The length of the papilla basilaris is in man, according to Retzius, 33.5mm, in parrots about 2.2mm.

4. The entire complicated supporting apparatus and Corti's organ of man are absent in the parrot. There exist, just as in other birds, the corn cells which are situated next to the basilar membrane and the hearing cells directly underneath the membrana tectoria which contains the hearing hairs which project into the latter.

By means of the projection apparatus, photographs of the wax corrosion specimens of the labyrinth of the parrot were demonstrated, and a large number of microscopic sections were shown to illustrate the structure of the parrot ear, the various terminal nerve areas, and the otoliths.

4. Dr. DENNERT (Berlin). **Acoustic and physiological experiments on the ear.**

The experiments of Dennert have shown that sound is transmitted to the labyrinth fluid in any one of three ways, the sound-conducting apparatus, promontory, and cochlear window, especially by the first. It is of great importance that membranes in general, and especially animal membranes, are not only excited by their own tone, but by one of their overtones and by every sound either simple or complicated in a medium containing air or in one containing fluid. The excitation is also transmitted to bodies which are connected with them in a closely connected system. This peculiarity of membranes in general, especially of the drum membrane, is suited to transmit sound-waves to the ossicular chain, and by this to the labyrinth fluid. Another favorable circumstance is furnished by the fact that the drum membrane is situated between two media which are similar and of the same nature as the medium which contains the exciting source of sound. In regard to the transmission of sound by mass vibrations or by molecular processes, a final decision cannot at present be given.

Sound is analyzed, according to Helmholtz and to the unanimous opinion of physiologists and otologists, in the membrana basilaris and its adnexa. It is possible here also to prove that from its configuration the supposition of its function is in accord with experimental acoustic observations.

Conclusions.

1. The theory of Helmholtz explains, as far as it depends upon the resonance theory, in a simple and natural way the main features during the act of hearing.

2. Sound proceeds by each of three ways, the tympanic mechanism, bone, especially of the promontory, and the round window to the labyrinth fluid. The tympanic mechanism is developed to the highest degree by nature, so that it is of great importance in the transmission of sound.

3. The membranes in the auditory organ play an important part in hearing—first, in regard to the transmission of sound from air to the inner ear by the connection of the drum membrane with the ossicular chain, and serve for the analysis of the sound by the connection of the basilar membrane with its adnexa.

4. The extraordinary correspondence of the anatomic conditions in the ear and the processes during hearing to the experimental acoustic observations cannot be disregarded.

5. **DR. KRETSCHMANN. On the associated vibrations of solid and fluid bodies.**

To understand the transmission of sound-waves to the labyrinth it is necessary to understand the reaction to sound-impulses of air contained in closed cavities, as in bone, *i. e.*, a solid body, or in the contents of the labyrinth, *i. e.*, a fluid. If we approach a vibrating tuning-fork to a rod of wood, metal, or glass, so that the prongs of the fork are situated parallel to the rod, the tone is increased. In this case there need not be a reflection of sound. If several pieces of wood be attached to a plate, the tone becomes increased if the tuning-fork be approached parallel to the long diameter. It does not increase in intensity if it is approached transversely across the middle of the piece of wood. If the ends of the fork be brought nearer, the tone is again increased, which reaches its maximum when the prongs of the fork are brought next to the heads of the wood. The same con-

dition is seen in living bone, which can be demonstrated in the simplest manner with the flat hand. If the vibrating tuning-fork is approached parallel to the direction of the phalanges, the tone is increased; if it is approached transversely to the direction of the phalanges, there is no increment of sound near the *vola manus*, but the sound is increased when the fork is approached to the articulation of the hand or to the tips of the fingers.

In the experiments quoted, solid bodies were caused to vibrate and to produce a sound.

We may expect that the flat cranial bones can be caused to co-vibrate by deep and middle tones which can be shown by an experiment. Cartilage acts similarly to bone; in fact it seems to react to a weaker impulse than bone. Homogeneous plates act just as the united pieces of wood. The sound is first increased when the vibrating tuning-fork is approached to the margin of the plate. If the plate has more or less the relation of the stapes plate, we find that in the case of most tuning-forks the place of the strongest sound production is the region near the short side in the median line and another point in the middle of the plate. It seems, therefore, evident that the stapelial plate is caused to vibrate by two branches which are inserted at the most favorable acoustic points. The fluid bodies react similarly to the solid bodies. If a vibrating tuning-fork is brought near to a rubber bag filled with water, the same conditions result as with the piece of wood. Of importance for the intensity of the increment of sound is the size of the mass of water, as bodies of small dimensions increase the tone more than those of large dimensions. The manner in which sound-waves are transmitted through the vestibular window is explained by the experiment. We can also demonstrate that the labyrinth fluid will be excited by sound-waves passing through the cochlear window and the bone of the labyrinth wall. The relation of air closed in solid cavities will not be discussed here. These facts must be carried in mind in all experiments to explain the hearing.

Discussion.—VOHSEN: The experiments of Kretschmann can be explained in a simple manner. The increase of the tone intensity results from the larger masses being set in motion. The increase in the intensity of the tone is lost in the duration of the vibration according to the law of the preservation of energy.

DENNERT: Kretschmann's experiments can be explained by reflection of sound and diffusion of sound. Sound is transmitted

to every body. The important fact, however, for the resonance theory and for otology is that a body is excited in its own period of vibration by sound. Only in this case does this body reply with its own period of vibration, and it is possible for this first body to transmit the excitation to a second body with which it is connected in a close system. The latter replies in its own period of vibration, if it possesses the same period of vibration as the first body; otherwise it does not reply. If this is applied to the ear, in one case the ear answers with an auditory impression, in another case it does not. The ear has probably developed by the gradual growth of elements of a distinct period of vibration from the simplest forms to its present complicated condition.

6. Dr. SCHOENEMANN (Berne). **Are there relations between the form of the temporal bone and the configuration of the tympanum?**

Two hundred and fifty skulls of the greatest variations were measured.

A distinction is made between pyramids with a flat roof and pyramids with a pointed roof. If the pyramid has a flat roof, the base of the skull is also flat, while in the pyramids with pointed roofs the bases of the skulls are distinctly uneven and the clivus steep.

The angle which the squamo-mastoid fissure makes with the horizontal diameter of the skull is in relation to the configuration of the roof of the pyramid, and is greater in pyramids with the flat roof than in those with the pointed roof. In cases in which this fissure is no longer entirely preserved, a line can be constructed in the long axis of the mastoid process, which forms the mastoid angle with the horizontal diameter of the skull. In pyramids with flat roofs the mastoid angle is large; in pyramids with pointed roofs it is small. Moreover, in the former the level of the pyramid apex is depressed in relation to the base; in the latter it is elevated. The form of the transverse section of the bony canal and, consequently, the position of the auricle show a relation to the configuration of the roof of the pyramid.

While the angle of declination and inclination of the drum membrane does not depend upon the form of the roof of the pyramid, the entire configuration of the drum membrane is influenced in that in pyramids with a pointed roof a wedge-shaped apex with sharp upper angle is present, while in pyramids with a flat roof it lies perfectly flat. Finally, in pyramids with pointed

roofs the sinus is nearer to the posterior wall of the external auditory canal than in the case of pyramids with flat roofs.

SCHOENEMANN illustrated his paper with numerous photographs, specimens, and tables.

7. Dr. ALBRECHT (Heidelberg). **The prognosis of early cases of acute middle-ear inflammation.**

Previous statistics have furnished a too unfavorable picture of the prognosis of middle-ear suppurations because they have represented generally the clinical material in specially severe cases. We receive a more correct picture of the true relation of the severe and the mild cases if we only compare the cases which come to treatment in the first three days of the disease. In these cases the genuine otitides give the most favorable prognosis. In these complete restoration with normal function is the rule. Complications occur in 2.85 %. This includes the possibility of a fatal issue, which is, however, very rare and in 175 cases occurred in only one.

The secondary cases of otitis are to be separated from the general cases. They lead more frequently, and as a rule, to spontaneous perforation of the drum. Their duration is longer and they are often complicated, and both in regard to mortality and a tendency to pass into the chronic stage they furnish a much poorer prognosis. The progress is the more unfavorable the more severe the general disease. The cases which perforated spontaneously in the first days ran a more unfavorable course than those which perforated late. It is striking that the cases in which a paracentesis was performed ran a less favorable course than those in which paracentesis occurred spontaneously. The age is also of importance in the duration of the disease. Nurslings generally present a very long period of disease.

8. Dr. SCHEIBE (Munich). **Statistics and treatment of acute otitis media.**

Our previous statistics on this point are based on material which varies too greatly to permit deductions. The best results can only be obtained when one and the same observer treats for a certain length of time half of his cases by one method and half by the other. The statistics of Koerner on the value of paracentesis are not convincing because dissimilar cases were compared. The speaker's statistics are not suited to answer these questions because paracentesis was only performed in the most severe cases.

Another method to obtain serviceable statistics is for every author to use only his own early cases, and distinguish his general cases from his secondary ones, and regard the age and condition of life of his patients.

The discussion on the subject is postponed until next year.

9. Dr. BLOCH (Freiburg). **A new and reliable method of testing the hearing.**

The new apparatus, which was demonstrated, consists of two thin plates attached to the prongs of a tuning-fork. The plate directed to the examiner carries a narrow slit through which a triangle can be observed exactly in the middle line in the posterior plate. During the vibrations of the tuning-fork on both sides of the triangle, a long white band is observed which becomes steadily smaller as the fork dies out. Two marks in the middle line of the triangle show the amplitude in millimetres.

The advantages are the following:

1. A maximal impulse is not necessary. The determination can be made from an amplitude which is small, and which approaches more the hearing threshold value of the ear to be examined.
2. The ear of the examiner is not used as a control if the hearing duration has been previously determined in the case of a number of normal-hearing persons.
3. This procedure is suited for determining the hearing in the important small and large octaves.
4. The procedure is equally well suited to determine air-conduction as bone-conduction.

This new apparatus is the invention of Dr. von Kittlitz.

10. Dr. POLITZER (Vienna). **Changes in the labyrinth in chronic purulent otitis.**

Twenty-one temporal bones were examined histologically. A series of ten to eleven cases is reported upon with numerous illustrations and microscopic specimens. These show various changes in the labyrinth windows, the vestibule, the semicircular canal, and the cochlea. Frequently in cases of perforation of the suppuration from the cochlea into the internal auditory canal, the peripheric part of the auditory nerve was infiltrated with pus, and in a number of cases divided by a demarcation line from the central part. In almost half the cases meningitis was the cause of death.

The demonstrated cases show how frequently these changes

occur in chronic purulent otitis, and it may be assumed that affections of the labyrinth occur very much more frequently than has been formerly supposed. The author possesses a number of specimens showing changes of the labyrinth with intact windows.

The diagnosis of suppuration of the labyrinth can be made in a number of cases where pronounced clinical symptoms are observed. The Weber experiment is unreliable. Of special importance is Schwabach's experiment which in most cases shows a diminution.

In regard to treatment, the previous methods of operating have not given satisfactory results. If we consider that these cases are usually very slowly progressing destructive processes which extend deep into the internal auditory canal, we should attempt to reach these organs by operation. This is possible by a method of operating proposed by Dr. Neumann, an assistant in Politzer's clinic, by which it is possible to advance to the internal meatus without injury to the facial nerve. The method of operating was demonstrated on a specimen. Six cases have thus far been cured by this method.

Dr. PANSE presented specimens and drawings which showed the importance of the tympanic window as the site of entrance for the suppuration.

The discussion is postponed to the meeting of the following year, when the subject of labyrinth suppurations will be one of the principal topics.

WANNER begs that the examination with tuning-forks in these cases will not be forgotten.

II. Dr. MANASSE (Strassburg). On labyrinthine chronic progressive deafness.

Twenty-nine temporal bones with chronic progressive deafness belonging to eight individuals were examined. Three of these, of two individuals, showed the typical refraction with stapes ankylosis. Two others of two individuals showed an ankylosis of the stapes by connective-tissue new-formation. In the other twenty-four cases there were changes in the labyrinth and in the auditory nerve. The latter belonged to cases between twenty-six and eighty years of age. As far as they had been examined with the tuning-forks, they presented, especially in advanced cases, the signs of labyrinth deafness. On microscopic examination, seventeen cases showed decided changes of the labyrinth, seven signs of old inflammation of the middle ear.

The changes in the sound-perceiving apparatus were:

1. In the ductus cochlearis.
2. In the ganglion spirale.
3. In the fine nervous channel of the modiolus and of the tractus foraminulentus.
4. In the trunk of the auditory nerve.

In general the changes were those of atrophy and connective-tissue formations. The origin of the disease cannot be explained. Striking is the great resemblance of these pictures to the conditions found in congenital and acquired deafmutism.

The subject is illustrated with drawings.

Dr. BRUEHL demonstrated microscopic specimens of the cochlea of a patient forty-four years of age, who lost his hearing in the course of tabes. Corti's organ and the termination of the vestibular nerve did not show any marked changes. The spiral ganglion and the trunk of the auditory nerve presented marked changes, which could be followed into the medulla oblongata. According to the grade of the anatomic changes, it can be assumed that the process of degeneration started from the spiral ganglion.

Discussion.—SCHWABACH mentioned that in his case no changes were found present in the trunk of the auditory nerve; moreover, there was no inflammatory change in the cochlea. He assumed, therefore, the presence of disturbances of development. At present he had a case of apparently congenital deafmutism, which answered to the picture just described by Manasse.

12. Dr. BLAU (Görlitz). **On experimental closure of the round window.**

The round window in dogs and cats was closed with cement, or with Fletcher's mass. The animals which had been operated on on one side walked in a crooked manner, inclining their bodies to the operated side. The head was held at the operated side, and in walking described a circle in the direction of the operated side. These symptoms slowly disappeared in from two to three months.

In the animals which had been operated on on both sides there was, after the closure on one side, the same disturbance of locomotion. The animals were afraid, and were not able to jump. In attempting to jump, the operated side was advanced, they described a slight arc in this direction, and then came to a fall toward this side. If the other side was also operated on, these

symptoms disappeared in a short time, the animals walked in a straight direction, and jumped correctly.

The animals which were operated on on both sides did not react at all to hearing tests. The animals which had been operated on on one side only reacted to all impressions of sound. If the side which had not been operated on was occluded as carefully as possible, the reaction was an unusually slow one.

In addition, the examination on the rotating disk showed the appearance of vertigo in the corresponding direction with nystagmus.

Autopsy performed after from two to five weeks showed that the cement had remained firm and that the round window had been completely closed. The histological examination has not as yet been finished. Inflammatory changes have been found in the membrana tympani and in the neighborhood of the round window. Unusual changes in the cochlea have not been observed. An additional report will follow.

13. Dr. HEINE (Berlin). **On the treatment of acute purulent otitis media, with congestive hyperæmia, after Bier.**

According to the procedure of Bier, experiments were made with congestive hyperæmia at Lucae's clinic. The method of Bier was carefully followed. On the whole, the congestion was well borne. The favorable influence on the pain was not so marked as was to have been imagined from Bier's report—in fact, in some cases the pain was increased.

Nineteen cases were treated with congestion. Of these, 4 were bilateral; 23 cases of otitis and 2 cases of acute otitis media without perforation, 3 with perforation but without mastoiditis, 6 of otitis with tenderness of the mastoid process but without swelling, 5 with infiltration of the soft parts, 3 with subperiosteal abscesses. Of the 23 cases of otitis, 8 were operated upon, 9 were healed, in 2 the mastoiditis is apparently improved. In these and in 4 other cases the treatment is not complete.

The cases with abscesses gave a good result. Of these, two were cured and one is still under treatment. It is, however, to be noted that a simple incision permitted an escape of pus. A very favorable result was observed in one case of Bezold's mastoiditis, where the symptoms of the mastoid process disappeared under the congestion, and it presented then a scanty mucopurulent discharge. In general, according to previous experience, the cases of mastoiditis with infiltration of the soft parts,

or with the formation of an abscess, seem to be most suited for this method. It is, however, not altogether without danger, because by masking the picture the right moment for operation may be missed.

Discussion.—The PRESIDENT does not consider that we can expect great results from these extended theoretic descriptions.

VOHSEN warns against the use of Bier's procedure in acute inflammations. It is, however, different if there is free discharge of pus.

ESCHWEILER remarks that the technique is not so simple as it appears, and that it should not be treated schematically. His own experiences with congestions are very favorable. However, his material was principally composed of cases of mastoiditis with formation of abscesses. The abscesses were opened with a small incision; the middle ear was not further treated. Eschweiler observed favorable results in Bezold's mastoiditis, and thinks that a distinction should be made between a collection of pus in the connective-tissue spaces and one in a preformed cavity lined with mucous membrane. He cannot agree to the theoretic objection of Vohsen.

HINSBERG was not able to observe any favorable results in his cases.

KOBRAK reported that in Brieger's clinic the congestion was practised by the aid of Henle's congestive bandage in a number of chronic affections of the ear and nose, and no favorable result was observed.

14. Dr. HENRICI (Rostock). **Further experiences in primary bone tuberculosis of the mastoid process in children.**

The author has previously reported upon eight cases of tuberculosis in the mastoid processes of children, and has collected the results of his examination. He is now able to add the histories of three further cases of children under seven, and two cases of children in the eighth year. The combined statistics show that primary tuberculosis of the mastoid process occurs in somewhat less than one sixth of the cases of mastoiditis of childhood. It is, therefore, very much more frequent than is generally allowed. This form has especial interest, on account of its character as primary bone tuberculosis, and not a disease transmitted from bone tuberculosis of the tympanum.

Three cases are reported in which there was a tuberculosis of the mastoid process, while clinically the tuberculous disease of

the tympanum could be excluded with certainty, and the upper respiratory passages were free from any tuberculous focus. The unusual amount of diploë found in the juvenile mastoid process plays apparently a predisposing rôle. The tuberculous nature is only to be recognized macroscopically in a few of the cases. The histological examination shows the true condition. The period of recovery is somewhat prolonged as compared with the usual cases of mastoiditis, though in most cases the simple mastoid operation leads to recovery. The possibility of a spontaneous recovery is given. The prognosis is more unfavorable the younger the child. The tuberculosis extending to the mastoid process from the tympanum is very much rarer in children than the primary form.

Discussion.—KOBRAK reports a case in which isolated tuberculosis of the mastoid process appeared to be present in a child. The operative wound healed kindly. The child subsequently died from an intercurrent disease, and an extensive old tuberculosis of the tympanic mucous membrane was found present.

15. Dr. G. ALEXANDER (Vienna). **On the clinic and anatomy of the ear in diseases of the vascular system.** (With demonstrations of specimens and pictures.)

The examination of cases of deafness in arterio-sclerosis showed degenerative changes of the same type as those which have been just mentioned by Manasse.

A condition is described as occurring in fifteen cases of lymphomatosis. In one case of apoplectiform Ménière's disease, with sudden deafness in the course of acute leukæmia, degeneration of the auditory nerve was shown by Marchi's method, which had extended to the right nuclei but not in a central direction beyond these, so that the posterior quadrigeminal bodies were normal. In the peripheric part of the auditory organ there were hemorrhages, lymphatic infiltrations, inflammatory processes, and degenerative changes of various parts.

A case of chloroma is reported. In addition to old hemorrhages in the vestibule, a hemorrhage was found in the aqueduct of the vestibule, which had led to a change of shape in the vestibule and in the membranous canal of the cochlea.

16. Dr. G. ALEXANDER (Vienna). **Demonstration of histological specimens of cases of congenital deafness.** (This is contained in the second volume of the *Anatomy of Deafmutism*.)

17. DR. LINDT (Bern). **Demonstration of microscopic specimens of a case of congenital deafmutism.**

The changes occupied the inferior part of the labyrinth, of the cochlea, and the saccule. The saccule showed ectasia and the formation of folds. The epithelium of the macula sacculi was degenerated. Further, there was an aplasia of Corti's organ in all its turns, hypoplasia of the membrane of Corti, degeneration of the epithelium of the stria and of the stria vascularis in general, and collapse of Reissner's membrane. There was an atrophy of the spiral ganglion in the basal turn, less marked in the other turns. The nerve fibres of the cochlear nerve are atrophic and show a peculiar degeneration which has thus far not been sufficiently accentuated in deafmutism. This degeneration is especially pronounced in the tractus foraminulentus. On the other hand, the nerve fibres of the vestibular nerve are normal. This condition can, therefore, not be explained at the present moment.

18. DR. HOFFMANN (Dresden). **On a case of otitis pyæmia.**

A case of bilateral genuine otitis is reported, in which at the end of three weeks the left and then the right mastoid process were operated upon. The diplococcus lanceolatus was found in pure culture in the pus. The suppuration extended from the left ear to the meninges, with the formation of a purulent meningitis and hemorrhages in the meninges. Invasion of the blood passages with the infectious agents either from the wound surfaces or by way of the lymph passages led to metastases, pulmonary abscess, purulent fibrous pericarditis, and left-sided pleurisy. As the sigmoid sinus and the bulb of the jugular vein on both sides showed smooth walls and no thrombus, the disease is regarded by the author as pyæmia through bacteriæmia. The small thrombi found at the autopsy in the lung and in the transverse sinus are regarded as compression thrombi from hemorrhages in the surrounding tissues. It cannot be determined whether the pulmonary abscess originated from these thrombi. The pus in the pericardium contained the diplococcus lanceolatus.

19. DR. PANSE (Dresden). **The clinical examination of the sense of equilibrium.**

Vertigo is a deception as regards our position in space. The vertical rotation follows in the plane of a large part of the horizontal semicircular canal. Irritation of the lateral ampullæ causes

a subcortical impression to arise as if the visual field was rotated in a horizontal direction towards the diseased side. The eyes follow this direction slowly and return with a quick motion to the original position. The sensation is that of a movement of the body towards the healthy side. If the irritation is sufficiently marked the body will be thrown in this direction. The correcting movements work in the opposite direction. The relations for the other nerve areas of the static apparatus are in the same relative condition. It is therefore desirable in expressing a disturbance of equilibrium that it be stated in what direction the more rapid movements of the nystagmus take place and in what direction the body is moved or is felt to be moved. The general terms, nystagmus or vertigo without more definite description, do not give us any aid for diagnosis.

20. Dr. ESCHWEILER (Bonn). **Demonstration on the pathology of empyema of the frontal sinus** (with specimens and drawings).

Four cases of chronic empyema of the frontal sinus are reported which presented entirely different pictures. In Plate I. the normal type of mucous membrane is described. This is very much thickened, and in the thickening all layers evenly participate.

Plate II. shows a similar picture, but the subepithelial layer presents a more marked infiltration, so that a division into two layers is no longer possible. There are more cross-sections of blood-vessels and the surface of the mucous membrane shows high papillæ.

In Plate III. the mucous membrane is very much thickened. The edge of epithelium appears on the surface and presents a very marked formation of tags. The subepithelial connective-tissue layer is divided into a more firm and a more loosely joined layer. In comparison with the two preceding specimens, the pronounced round-cell infiltration and the richness in blood-vessels are noticeable.

In Plate IV. the papillary hypertrophy obtains its most marked grade. The epithelium is thick and in places shows mucoid degeneration. The round-cell infiltration is pronounced, sometimes diffuse, and occasionally in areas.

Plate IV., *b*, of the same case, shows the mucous membrane from the posterior surface of the frontal sinus with hemorrhages in the tissue and ulcerations. Papillæ also are formed in these

cases, and there is a relatively broad basal membrane under the epithelial layer.

These various types of pathological changes correspond to the various clinical forms. Case 1 shows a more purulent discharge from the nose without any tendency to hypertrophy; the inferior sinus communicates with the nose, it contains no pus, and has only a thickened mucous membrane. In Case 2 there were but little discharge, foetid scabs in the nose, small polypi, and atrophy of the mucous membrane. In Cases 3 and 4 there was pronounced cream-like pus with marked swelling of the nasal mucous membrane. In Case 4, in addition, there was an abscess with a bony fistula in the outer wall.

21. Dr. KREBS (Hildesheim). **On caries of the medial wall of the tympanum.**

The author has observed cases of chronic suppurative otitis where before operation the inner tympanic wall was exposed and did not present any suspicious signs. After operation, caries was observed in the tympanic inner wall. He believes that this post-operative caries was produced artificially, by mistakes during operation or during the after-treatment. These mistakes occur either by direct injury with the chisel, the remaining behind of fragments of bone in the tympanum, pressure with the protector, incautious use of the sharp spoon; during the after-treatment, by mistakes in asepsis, careless probing, too tight packing, too frequent changes of dressing, improper use of caustics, especially of chromic acid. Finally, the treatment and cause of genuine caries are described.

Discussion.—JENS recommends in place of the protector a pledget of gauze, placed in the aditus.

22. Dr. HAUG (Munich). **On the conservative treatment of suppurations in the attic.**

The author reports that in the course of six years he has been able to cure sixty-four out of ninety-eight suppurations in the attic, though his method is not suited for all cases. It consists in, first of all, enlarging, if necessary, the site of perforation, so that a tympanic canula of large calibre can be introduced. The irrigations are made with a solution of permanganate of potash or boric acid. The cavity is then dried, followed by a slow injection of a solution of perhydrol 10.0, in equal parts of alcohol and glycerin 20.0. This solution is retained for one quarter hour in the ear, with the head turned toward the opposite side. The

canal is then dried and a small pledget of cotton, soaked in a strong solution of iodine-potassium iodide-glycerin inserted. The canal is then packed with gauze. The procedure is sometimes very painful. If necessary, it is repeated in ten days. Haug has never repeated this procedure more than three times, because it is without avail if the case has not healed up at that point.

23. Dr. F. ALEXANDER (Frankfurt). **On ocular complications in diseases of the accessory nasal cavities.**

Two rare cases of ocular complications are reported. The first is that of a man who suffered after influenza from an acute attack of left-sided sphenoidal empyema and of right-sided posterior ethmoidal empyema, with bilateral papillitis. The empyema was widely opened from the nose on both sides. This was followed by a complete cessation of the ocular symptoms. In a second case there was an abscess in the vitreous of the right eye in left-sided empyema of the antrum, with involvement of the left anterior ethmoidal cells. Operative treatment of these and of the maxillary antrum resulted in disappearance of the abscess of the vitreous, with marked improvement of the vision (from counting fingers at $\frac{1}{2}m$ to $V = \frac{1}{10}$). The author regards these rare complications as metastases, for which he has observed no analogon in literature.

24. Dr. MANASSE (Strasburg). **Demonstration of microscopic specimens.**

These were obtained from the labyrinth of a man who had become deaf fifteen years before death, from an injury to his head. A fissure is observed in the promontory and stapes running an exactly symmetrical course. At present, after fifteen years, there is no bony but only a connective-tissue union at the site of fracture. There is, in addition, an extensive new formation of connective tissue and bone in the vestibular apparatus and in the cochlea, with atrophy of Corti's organ, of the cochlear ganglion, and with foci of degeneration in the auditory trunk.

REPORT OF THE TRANSACTIONS OF THE
SECTION ON OTOTOLOGY, NEW YORK
ACADEMY OF MEDICINE.

STATED MEETING, MAY 11, 1905. DR. HASKIN, ACTING CHAIRMAN.

Case of cholesteatoma of the middle ear and mastoid.

Presented by Dr. TOEPLITZ.

The patient, a young man, twenty-four years of age, presented himself at the beginning of December, 1904, with an otorrhœa of the left ear, which was an exacerbation of a former trouble. There were scanty discharge and granulations coming from the attic, and some caries in the middle ear and toward the region of the antrum. There were also some black masses which seemed to be cholesteatomatous. After curetting the ear, operation was advised. His former history was, that at one year of age he had had scarlet-fever, followed by a discharge from the left ear, which continued until he was fourteen years of age, when he was first operated upon by a member of the Section for acute mastoiditis. The year before, he had been operated upon for polypi of that ear, so it might be considered a chronic condition. The discharge continued after the first operation, and in 1899 another member of the Section made a radical operation. After this there was no discharge for four years, until the symptoms appeared in the beginning of December.

On opening the mastoid, an extensive destruction of bone was found leading into the middle ear. The posterior wall had been entirely removed at the second operation, so that it was only necessary to remove the outer wall and what bone was left. There was considerable cholesteatoma in the middle ear and mastoid, and it was thought best to leave a permanent opening, so that the ear could be watched. In order to do this, a Panse flap was first made, then a flap from the posterior edge of the

mastoid, an inch and a half long, was turned in and stitched in place; Thiersch grafts were applied to the scalp from where the flap had been taken, and also to the lower edge of the wound. The posterior flap healed readily; in the third week after the operation the inner cavity was covered with a graft, which completed the operation. The patient was perfectly well inside of seven weeks, and the entire cavity is now lined with skin, and the ear is in excellent condition. It will be an easy matter now to close up the opening, and the deformity will be very slight.

Report of a case of panotitis resulting in meningitis, with pathological findings. By GEORGE S. DIXON, M.D. (Published in full on pages 479-482.)

Discussion: Dr. TOEPLITZ said that he was very glad indeed that he was able to be present, and learn the kind of work that was being done here in this line and to see the specimens which had been presented, and that Dr. Dixon and his associates were certainly to be congratulated on the character of the work that was being accomplished. It was just the kind of work that Moss and Steinbrügge had done in Germany for years in a very painstaking way, and he had not known before that this kind of pathological anatomy of the middle ear was being studied in this country.

Dr. EAGLETON inquired whether the cases showing Friedlander's pneumococcus presented any unusual features in their history.

Dr. DIXON replied that he had intended looking this matter up and giving the statistics of the Infirmary, but that the histories were not available, and he had not been able to do so yet. From his recollection, however, it seemed that the *bacillus mucosus capsulatus*, a better term than Friedlander's pneumococcus, has been responsible for a great deal of latent trouble. The case just reported was peculiar. It was his belief that the patient had this trouble latent throughout her temporal bone, and that it only needed irritation to give it another start, and this irritation was furnished when the probe touched the stapes, dislocated it, and let the pus through, thus promoting interchange. There may have been pus in the labyrinth already—probably was, as the length of time between the chill and her death was so very short that he did not believe the great destruction which existed in the temporal bone could have taken place within that interval. The process must have been going on before. Another point—he

believed if a differential blood count had been made when the case first came in important data would have been obtained. It is now generally conceded that if there is even a slight leucocytosis, with a polynuclear count averaging over eighty per cent., an exploratory operation is permissible. The Doctor repeated that he was becoming more and more suspicious when he found that he had to deal with Friedlander's pneumococcus, though he was not prepared to go on record in this matter until he was able to go over the records of the Infirmary and straighten the matter out. The cases which he remembered, however, had been very unsatisfactory.

Dr. WILSON inquired whether these had been pure cultures or mixed infections.

Dr. DIXON replied that it was a pure culture. As a rule, the secretion examined was from the external canal. Generally one germ was found to predominate, and that germ was held responsible. Certain germs in preponderance in smears were accepted as guides. In a vast majority of cases you would find not more than two germs, and as a rule the one that predominated in the discharge would predominate in the culture, but this was not always true.

Dr. TOEPLITZ told of a case which he had presented to the Section last year, a young man of twenty-four years of age, upon whom he operated at the Post-Graduate Hospital a year and a half ago, in whom the only sign of a suppuration going on was a leucocytosis of 30,000. The patient looked very ill and was running-down in health, but in spite of all kinds of examinations—typhoid, malarial, leucocytosis, and blood—no other cause was found. This was also a mixed infection, with a diplococcus predominating. Operation was finally decided upon, and when the cerebellum was exposed there was no abscess, but upon proceeding posterior to the sinus a deep-seated abscess was discovered. After this was removed the patient went on to recovery, but the only guide to the deep-seated suppuration was the leucocytosis.

REGULAR MEETING, OCTOBER 12, 1905. DR. EMIL GRUENING IN THE CHAIR.

Exhibition of Specimens.

Sequestra involving the facial canal and roof of the horizontal semicircular canal removed in the course

of a radical operation. No facial paralysis. By J. F. MCKERNON, M.D.

The patient was a girl, seven years of age; gave the following history: After an attack of scarlet fever in August, 1902, the left ear became inflamed. Three months later a mastoid operation was necessary. The wound did not heal, a discharging sinus remaining. In February, 1903, the wound was curetted and a considerable area of necrotic bone removed. A third operation was necessary in April, 1904, when further granulations and more dead bone were removed. After this the condition still remained unchanged, a sinus existing leading directly into the middle ear, and there was an abundant discharge of pus from the ear. The fourth operation was undertaken in September, 1904, when a sequestrum of bone was removed in the region of the anterior zygomatic root. In May, 1905, another operation was performed, the malleus and incus being removed and the middle ear curetted. This resulted in a decrease of discharge from the ear but the posterior wound continued open.

When I first saw the patient the upper two-thirds of the mastoid wound were covered with unhealthy granulations with a thick discharge. The auditory canal was filled with pus, with total absence of the drum membrane. Areas of softened bone were present in the middle ear. Another operation was suggested, and this, the sixth, was performed September 7, 1905. The operation revealed extensive destruction of bone in the inner table of the mastoid process, in the zygomatic region, in the tympanum, about the tubal opening, and in the floor; there was a perforation through the tegmen tympani. Upon inspecting the region through which the facial canal passes, that portion of it, corresponding to where the nerve leaves the skull, was found to be more prominent than usual, and upon using the probe seemed to be loose and held down in its position by adhesions. These adhesions were removed with the director and forceps, by a process of picking at them similar to a dissection when glands in close proximity to vessels are removed, and after several minutes of this work the sequestrum of bone, which I show you here and designate as No. 1, was removed, and upon examination it proved to be the roof of the canal, showing distinctly the groove for the nerve on its under surface. In separating the adhesions which bound this down, it was noticed that a small mass in the region of the horizontal semicircular canal was movable, and this was found to be bound

down by adhesions, which were separated in the same way as described in the other sequestrum, and upon its removal showed that it was a portion of the roof of the horizontal semicircular canal, showing the characteristic markings of this bone. This is the specimen, No. 2, which I show you. After removal of the first sequestrum the slightest touch of the probe on the nerve caused distinct twitching of the muscles of the eye.

The wound was dressed in the usual way and closed posteriorly. The child made an uneventful recovery. There was no facial paralysis. The posterior wound healed rapidly, and at the present time the middle ear is practically well.

This case illustrates very well the necessity for performing the radical operation where the discharge continues from the middle-ear cavity for any time after the mastoid has been opened and properly drained. The indications for this operation are also, I believe, quite as distinct where, previous to a mastoid involvement, we have to deal with a chronic purulent discharge from the middle ear, for in these cases if the mastoid is simply opened and drained a very large proportion, if not all, of these cases continue to have discharge from the tympanic cavity, and sooner or later we are confronted with the necessity of relieving this condition.

Sequestra involving facial canal removed in course of radical operation. Facial paralysis existed before operation. By W. H. HASKIN, M.D.

Dr. HASKIN stated that he wished to show this specimen in connection with that presented by Dr. McKernon. The woman had suffered for many years from a suppurating ear, and finally came to the Manhattan Eye and Ear Infirmary for treatment. Operation was advised, and as soon as the cortex of the mastoid was removed pus flowed out profusely. Further examination showed the inner extremity of the posterior wall of the canal to be necrotic, and this large piece of bone occupied the place of the facial canal. It was loose, and was picked out with the forceps. When the patient entered the hospital she was suffering from intense pain, with a subdural abscess, and marked facial paralysis, which she had had for a year. She recovered from the operation, but not from the facial paralysis.

Dr. BALLIN presented an **electric lamp** which he had observed in an office abroad, this summer. He showed it on account of its simplicity, as it can readily be made by any one.

It consists of an ordinary 16-power incandescent light, which is incased in a hood made of ordinary plaster of Paris. It has a round opening on one side about two and one-half inches in diameter, and when the current is allowed to pass the light thus produced is very intense—almost double the ordinary power.

The advantages of this lamp lie mainly in the fact that it is easily portable and does not consume any more current than the ordinary incandescent light. It also does not emit much heat.

Dr. GRUENING said that it certainly was a good light and seemed well adapted for use with a reflector.

Dr. EMIL MAYER said that he could testify from experience that he has found it of great value.

Presentation of patient and report of a case of deformity of the auricle, resulting from perichondritis following a radical operation. By W. H. HASKIN, M.D.

Dr. HASKIN said that, as the Section could see, the auricle was practically destroyed. The wound had healed perfectly and the ear within was perfectly dry. He believed that this case of perichondritis was due to the previous condition of furunculosis, and not to infection from the radical operation properly speaking. As far as he could learn the condition was very unusual; she had not been able to find the reports of any cases in recent literature.

Discussion.—Dr. HURD said that he had seen the case two days before the opening of the swelling, and at that time he could feel no fluctuation. It was opened behind the ear and pus was found. The focus of the infection seemed to be in the flap where it was attached to the bone behind. It might have been a furuncle. At that time there was no cartilage, the concha being entirely destroyed, and nothing but skin in front.

Dr. ARNOLD KNAPP said that he did not think perichondritis was at all rare, especially since the introduction of the radical operation, and that most of the members of the Section who operated must have encountered such cases. The poor results generally obtained were, in his opinion, due to the following cause: the focus of the infection is generally in the cartilage, a tissue which is poorly nourished and consequently recovers slowly; it is not directly influenced by the expectant treatment usually followed—antiseptic applications and incisions. Cases of

perichondritis after operation should be treated radically. As soon as the condition appears, the cartilage should be exposed and all disease thoroughly removed. As soon as the diseased cartilage is removed, the inflammation will subside and a deformity of the auricle need not necessarily follow. This treatment is very painful and requires a general anæsthetic.

Dr. GRUENING said that some fifteen years ago he had written a paper on perichondritis, and at that time the treatment of such cases was largely expectant. When fluctuation showed at the posterior or the anterior surface of the auricle, incisions were made. At the time he wrote the paper he had treated two cases by transfixion and drainage; he transfixed the auricle and put a drain through the transfixed portion, and both cases healed without deformity. This was not so thorough a treatment as that which Dr. Knapp recommends, but it was a better treatment at that time than the treatment of the surface of the skin, and he thought it would still be a good treatment.

He agreed with Dr. Haskin about the possibility of this case being due to the existence of the furuncles. He had not seen any cases of perichondritis after his radical operations, but he might do so some day. If you make the flap and cut the cartilage, it is very likely that the condition would frequently follow. He thought the title of the report was somewhat misleading—it was not a destruction of the auricle, but merely a perichondritis. He thought that if cases were treated as thoroughly as suggested by Dr. Knapp, or if a transfixion of the auricle were practised early, the deformity would not be so great.

Dr. KNAPP, replying to a query as to in how large a percentage of cases he had seen perichondritis follow the radical operation, said that he could not give the exact percentage; reference to this condition was often made in literature. Within the last two years a paper had appeared in the ARCHIVES, written by Professor Koerner, in which he confirmed the association of post-operative perichondritis with the presence of the bacillus pyocyaneus, which is a very striking observation, and the speaker would like to ask Dr. Haskin whether he had observed the characteristic greenish saturation in the dressings.

Dr. HASKIN replied in the affirmative.

Electrolysis in the treatment of chronic Eustachian stenosis. By F. T. HOPKINS, M.D. (Published in full on pages 495-501.)

Dr. KENEFICK said that some years ago, while practising this treatment in the New York Eye and Ear Infirmary, he had written a paper on this subject, reporting his results. Since then the work has been carried on by others. In private practice there is not so large a number of cases to select from as in hospital work, but in the many instances in which he has followed this treatment his opinion remains the same as to its efficiency. He was inclined, however, to feel that he would more and more restrict its application to cases of long standing, and especially those chronic cases which complain of extreme tinnitus and vertigo without extreme deafness. Such cases are found mostly in adults, and date back to attacks of scarlet-fever or diphtheria in childhood. In these cases the hypertrophic condition has largely disappeared, and the stricture is of a more dry and less vascular character, and application of the electric bougie is attended with less reaction. In these cases also he had known the bougie to produce, as far as he could make out, a resorption of the fibrous tissue, as was ascertained months after a single application. This was followed by a relief of the tinnitus and vertigo, and restoration of the hearing. Since reading his paper on this subject, two of his most successful cases were themselves otologists, whose cases corresponded to those conditions just described, of many years' standing. Perhaps it is most efficacious in those cases of long standing in which the complete, or almost complete, closure of the Eustachian tube takes place at the tympanic orifice. On examination with the otoscope these cases give the impression that the tube is clear, and in such cases one has to be persistent in reaching the tympanic cavity. Dr. Hopkins has spoken of the "tympanic expression." That is very marked. The tube is so poorly supplied with nerves that the bougie does not cause the same degree of pain that it does in passing across the posterior wall of the tympanic cavity. He thought it passed along the tympanic membrane in many instances, thus causing pain and irritation. In a general way then, he would say that long-standing closure of the tube, tinnitus, a medium degree of deafness, and extreme vertigo were favorable cases for the electric bougie in proper hands. Dr. Hopkins had spoken of the care necessary in the technique of the operation. Much to the speaker's surprise, at the time his paper was published he received inquiries from every direction, two from physicians in neighboring States, saying that they noticed he insisted upon the use of the *negative* pole, and

would he explain why. Of course it was not to be wondered at that these men sometimes had difficulty in removing the bougie from the tube, the point being that they turned on the positive current into the gold bougie, setting free oxychloride of gold inside the tube, and instead of liquefying, and thus lubricating the region, the positive pole dried it, and caused it to stick. The only way to remove it is of course the introduction of the negative current. Dr. Hopkins said that the current should be shut off before removal. Of course he means before the removal of the catheter from the nasal chamber, not before the withdrawal of the bougie into the catheter.

Dr. GRUENING remarked that in regard to the subject under discussion there were many doubting Thomases in the profession. There was one point in Dr. Hopkins's paper which struck him particularly—where he said that we must not inflate or we immediately shall have emphysema. If you get that, there is a false passage. If you see emphysema after the ordinary use of the bougie, you can be sure that you have made a false passage.

Dr. PHILLIPS said that he was a firm believer in the use of the bougie in cases of deafness due to various forms of obstruction of the Eustachian tube, but that he was not an enthusiastic believer in the use of the electric bougie. For a considerable time he had used it in all his cases. He understood the technique perfectly, and was surrounded by a complete and perfect armamentarium, including all electrical appliances. He had spared neither time nor patience in carrying out the requirements, and he therefore felt it his duty to report the unfortunate outcome in several of his cases. He had in his possession several gold bougies, of which from a half to two-thirds of an inch had been lost, and which ends were to-day located in the Eustachian tubes of the unfortunate patients. His experience certainly differed from that of Drs. Hopkins and Kenefick. He could not agree with the reader of the paper or with others who had described this method with so much enthusiasm, that the electric bougie was less painful than the ordinary whalebone. He himself advocated the use of the whalebone bougie in these cases, and he never used the electric bougie unless he had absolutely failed to enter the tympanum with the bone bougie, and when he failed with the bone he usually found that he failed also with the electric bougie. In his experience the results had been equally satisfactory when the bone bougie was employed. He was ex-

tremely sceptical as to whether the electric current had any particular effect on the Eustachian tube. He thought all the results could be obtained by ordinary dilatation, and that until the instrument makers could furnish a safer form of gold bougie he considered that method dangerous. In his experience, the gold bougie seemed to burn off or break at just about the distal end of the catheter, while the current was on and the bulbous end was embedded in the stricture. This had happened with him four or five times. Others had reported similar experiences. He had seen no especial evil effects from these broken bougies, and in one instance the piece had worked out. The patients still suffered from the deafness and tinnitus, but were not conscious of the presence of the bougie in the tube. He did not altogether condemn the electrical bougie, and expected to use it at times, but he felt that there was no special virtue in the current itself. He was never afraid to inflate after he had used the bone bougie, and got the benefits of inflation immediately after passing it, as he had not been able to do with the electric bougie. He had never had a case of emphysema after inflation, and he felt that this was a strong point in favor of the bone bougie, as he believed that emphysema always indicated a false passage. As to his electrical equipment, he had every improvement that could be procured, and never used more than thirty volts or carried the current above five milliamperes, usually only three or four.

Dr. SIMPSON remarked that inasmuch as Dr. Hopkins's paper was mainly on technique, he would confine his remarks to that point. He had used electrolysis a great deal, and as far as overcoming the stricture was concerned he felt that when there was a definite organized stricture this was the best if not the only method of relieving it. He thought it very unsafe to attempt to dilate an organized stricture by means of any kind of force. You get a wound. You do not get a wound in the pure sense by electrolysis, you get a chemical absorption. Another point was that a great many strictures which at first resisted the passage of the bougie could be readily overcome by the use of a little bland oil, like benzoinol, injected into the tube through the catheter, and then passing the bougie. It was quite surprising how many strictures could be overcome by simply lubricating the tube in this way, thus obviating the need of electrolysis. He thought that a great deal of error was occasioned by not seeing where the Eustachian catheter was going, and believed that the cathe-

ter should always be passed into the tube with the aid of a rhinoscopic mirror, and not alone by the sense of touch. By this means you can always pass the Eustachian catheter well into the trumpet-shaped end of the tube, and this is the only way in which you can get an absolute idea of how far in the bougie has passed. Sometimes when you pass the catheter and then the bougie, instead of having the catheter flush in, you will find that you have a space between the end of the bougie and the end of the catheter, and you cannot be sure that you are thoroughly in the Eustachian tube unless you see it with the rhinoscopic mirror. This will often save you the mortification of finding that you have the Eustachian bougie in the fossa of Rosenmüller instead of in the tube. He was quite surprised to learn that Dr. Phillips had had such an unfortunate experience with the breaking of the gold bougie. He himself had had this accident happen but once, but felt that he was at fault on that occasion. Another condition which sometimes occurs, and which was difficult to explain, was that sometimes in withdrawing the Eustachian bougie it was impossible to pull it out without exerting a great deal of force—taking a pair of ordinary nippers and pulling with all one's might. He was not sure what caused this, but it happened in his practice every once in a while, though it did not seem to produce any trouble.

Dr. HARRIS said that some years ago at the Manhattan Eye and Ear Infirmary he had devoted most of a year to work of this character. He had approached the subject in an unbiased manner, and reported his results shortly afterward before one of the national societies. Some time later he published a second series which he had reported at the American Otological Society, and his conclusions then and now are the same—that the electrolytic bougie is of value in certain carefully selected cases and in competent hands. Dr. Phillips's statements were a little more pessimistic than he could endorse, but were in the main his views. He complimented the reader of the paper on the thorough manner in which he had presented the optimistic side of the question, and said that it was always interesting to hear Dr. Kenefick's views, though he did not think the latter was quite so optimistic as he had been a few years earlier. Dr. Harris did not think that the accidents which had occurred could always be ascribed to improper technique—certainly not in many instances. He had known of many such that had occurred where

the proper instruments had been employed in the hands of competent operators. He had known of new bougies breaking and these are not the only accidents that happen. It could not be too strongly emphasized that this method should only be used by the most competent hands. Consequent to the reading of Dr. Kenefick's paper there was a wave of enthusiasm on this subject which swept over the country, and the bougie was often used improperly, and in many conditions where it was not indicated. He thought it should only be used after the whalebone or celluloid bougie had been tried and failed to produce the desired result. He had often known of the return of the condition after the stricture had been dilated. It was very interesting to see how the personal equation enters into this matter. In the series of cases which he had reported some were relieved from the tinnitus, others were not. The actually existing condition should also be borne carefully in mind. Is there a well organized stricture which disappears? Dr. Dench has called attention to what may happen when that occurs. Does it not pass through some band of mucous membrane instead of going through the proper channel? He thought it wrong to condemn the method altogether, but that the cases should be selected with great care, and that it should only be resorted to when other methods had failed. Used with the proper asepsis and skill to which the reader of the paper has called attention, it is an aid which we cannot afford to dispense with.

Dr. McKERNON said that the occurrence of an emphysema could be plausibly explained. The point of the bougie after emerging from the catheter sometimes does not enter the calibre of the tube but simply impinges there, and if any pressure was used it was easy to cause an abrasion. This does not take place in the body of the tube but at the pharyngeal orifice, and then if inflation takes place in a few hours we are likely to get an emphysema. He had used both methods of opening the tube, and thought that the electric bougie, with care and attention, in proper hands, and selected cases, had its uses. He had helped cases with it. He had not had a series of cases of complete cures, but had had a series of selected cases where relief had followed the use of this method after other methods had failed. He thanked Dr. Hopkins for the paper, for he had emphasized points of great importance. He thought that the gold bougie had often been used where the originator of the method had not

intended. He did not think that every case of Eustachian stenosis, when first seen, even after having been seen three, four, or five times, should be treated at once with the bougie. The thickened condition which is in the cartilaginous portion of the tube would often disappear under inflation. He was convinced, however, that the method was of positive value in certain selected cases.

Dr. KENEFICK asked Dr. Phillips where the bougie usually broke—just where it left the catheter, or farther along after it entered the tube.

Dr. PHILLIPS replied that it seemed to him it usually broke at the point where for the time being it was in contact with the distal end of the catheter. It might, however, be at some distance from this point in some cases, but never inside the catheter.

Dr. KENEFICK replied that he had made from 150 to 250 applications of the bougie, but had never had an untoward result or accident of any kind, not even an acute otitis. He knew that bougies had broken in capable hands, and felt that he himself had been fortunate. He was always careful to remove the bougie while the current was passing. Both in the application and removal the lubricating effect of the current was required. He had never had such an experience as Dr. Simpson mentioned. Dr. Harris seemed to think that his enthusiasm on the subject had decreased, but he wished to state that he was as enthusiastic about it now as he had ever been for the class of cases described in his paper. He had said then distinctly that the cases reported were of long standing and had been treated by all the known methods, and with this class he continues to get the same good results.

Dr. SIMPSON suggested that possibly the breaking of the bougie at the point mentioned by Dr. Phillips might be due to improper insulation of the catheter—that possibly where it leaves the current it might come in contact with the silver catheter. To prevent this, he himself invariably uses a rubber catheter, and had never had any trouble.

Dr. MCAULIFFE said that he had used the bougie with some success, and thought the explanation was somewhat unsatisfactory. The bougie could fit only the smallest part of the tube, consequently how could it engage or enlarge the stricture in the wider parts. In order to determine the effect of electrolysis he had tried the effect of the electrolytic needle on trachoma, and

had passed the needle time after time without any effect. He thought that the true explanation was found in the action of the galvanic current on the muscles.

Dr. PHILLIPS said that he wanted to emphasize the question of force. It was his experience that you have to use the same force with the electric bougie as with the ordinary bone bougie, in order to get through the stricture. He also desired to recommend the use of the diagnostic tube before passing the bougie, as the patient's word that air was entering the tube was unreliable. There would be fewer false passages if the presence of the tip of the catheter in the mouth of the Eustachian tube was demonstrated by the Politzer bag and diagnostic tube.

Dr. GRUENING said that the reading of this paper seems to have reopened the whole question. A wave of electrolytic enthusiasm swept over the country some years ago, but there was now rather a low tide in the current. Dr. Hopkins had presented the subject logically and well, but had demonstrated nothing. He wished to make this statement before Dr. Hopkins closed the discussion.

Dr. HOPKINS said that he had no further remarks, except in reference to the trouble which Dr. Phillips had experienced in the breaking of the bougies; he found that the bougies made of one piece of gold were safer and better than those offered by most instrument-makers consisting of two pieces, the tip being attached to the stem of the bougie.

Concerning the safety of **primary skin grafting after the radical operation**, Dr. GRUENING said that, the day before, a post-mortem had been made on a case where a most beautiful plastic operation had been performed in connection with the radical operation for chronic otitis media. The canal and also the tympanic wall were lined with skin, but behind that skin was pus and the patient died of meningitis. Here was a case of a man operated upon a few months ago, with a large flap lining the whole canal, resulting apparently in quick healing. He mentioned this matter in order to bring about a discussion of the propriety of making these very large flaps and covering over the denuded bone. He felt that the practice might require a little revision.

Dr. PHILLIPS inquired if it was one of the large flaps from the outside, and Dr. GRUENING replied in the affirmative.

Dr. MCKERNON inquired whether the dura had been exposed in the primary operation, and if the dura was covered by the graft.

Dr. GRUENING replied that he could not tell about this. He had only seen the case the previous day before the patient died, and found that the flap operation had been done. The autopsy showed a serous meningitis and pus behind the flap.

Dr. McKERNON said that he thought it was bad practice to use a graft over an exposed area of dura. Last summer he had seen a case where the radical operation had been done for chronic purulent involvement of the ear. The patient was seventeen years of age. Five weeks after the operation the temperature rose to 104.5° F, and in three days he gave all the evidences of intracranial pressure. Operation was performed, and a large abscess was found just above the tegmen, and was evacuated. The pus in the abscess cavity had no odor. After evacuating the pus, a sinus was found leading from a perforation in the tegmen directly upward and inward to the abscess cavity. The patient recovered.

Dr. KENEFICK inquired the length of time that had elapsed since the operation, and upon receiving the reply that this had not been ascertained owing to the condition of the patient, said that he had asked because the question arises as to whether any operative procedure had been suggested.

Dr. GRUENING said that he had seen the man *in articulo mortis*, and no diagnosis had been made, and there were no indications to proceed immediately.

Dr. ARNOLD KNAPP said that it hardly seemed fair to condemn the practice of skin-grafting after the radical operation from the incomplete report of this case. The autopsy report simply stated that there was some pus behind the graft and that the patient died of serous meningitis. From these data it cannot be definitely stated that the meningitis arose from the ear. Of course the great objection to planting grafts at the first operation is that one is apt to overlook bone which is not entirely healthy, though a graft will not adhere to a diseased surface.

Dr. McKERNON inquired whether he considered it good practice to put a flap over an exposed dura.

Dr. KNAPP replied that in his opinion it would be perfectly safe to do so if the dura seemed perfectly healthy and there were no intracranial symptoms.

Dr. McKERNON replied that the reason he had asked this question was that aside from the case just reported he had seen a similar one a year ago. The meningitis might have occurred

without the graft being placed, but in these cases there was a distinct area of dura exposed, and it occurred to him that when the graft was put on the adhesions formed might have prevented the pus from coming out.

Dr. GRUENING said that he felt that this subject was not absolutely settled and was still *sub judice*. It was perhaps better to have a slower healing, and not a large flap covering up bone which may be diseased. He thought it was difficult to know the absolute condition of the bone or whether the skin was absolutely clean. There are many germs which might be transplanted, and this question should be considered.

REPORT ON THE PROGRESS IN OTOTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1904.

BY PROF. ARTHUR HARTMANN, BERLIN.

Translated by Dr. ARNOLD KNAPP.

ANATOMY AND PHYSIOLOGY.

374. DENKER. **The Eustachian tube of the ant-eater.** *Zeitschr. f. Morphologie u. Anthropologie*, Bd. viii., pp. 1-10.

375. ZIMMERMANN. **On the physiologic importance of the labyrinth windows.** *Arch. f. Anat. u. Physiol.*, 1904.

376. ZIMMERMANN. **Additional observations on the importance of the labyrinth windows.** *Ibid.*

377. TOERNE. **On the bacterial conditions of the accessory cavities of the nose and their protective agencies against bacteria.** II. and III. *Nordiskt medicinskt Archiv*, 1904, Abt. I., book 2, No. 6.

374. A large bony cavity which is situated orally off the bulla ossea in the *Myrmecophaga jubata*, and which is not present in any other vertebrate, is absent in the *Myrmecophaga didactyla*.

It has been shown that the Eustachian tube exists in the *Myrmecophaga didactyla*.

The tube in this animal is not a sheath but a broad cavity surrounded by a membranous wall. In place of an osseous tube there is a round aperture in the posterior lower corner of the tympanum to which the membranous tube is attached.

376. ZIMMERMANN repeats his views on sound conduction through the cranial bones and corrects the criticism recently made by Lucae.

H.

377. The subjects for examination consisted of fresh calves and human cadavers twenty minutes after death. The maxillary antra were broadly opened and in various places lines of lamp-

black were made. It was ascertained that the ciliated movement about the openings of the sinuses in all directions converged toward the respective sinuses, then passing along the connecting canal farther into the nasal cavities, passed principally forward, though the author has observed a tract which passes backward. In the inner wall the rapidity of movement varies from 0.4 to 1.0 mm a minute. It is slower in the lateral wall and at 2 cm distance from the opening can no longer be observed. There is no observable movement at the floor.

Bacteriological examinations of the discharge from the maxillary antra were also made.

JÖRGEN MÖLLER (Copenhagen).

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

378. SCHMIEGELOW. Report of the oto-laryngologic department of the St. Joseph Hospital, 1903. Copenhagen, 1904.

379. SPIRA. On the report of the out-patient department for diseases of the nose and the ear in the Jewish Hospital in Cracow in 1903. *M. f. O.*, 1904, No. 7.

380. On diseases of the ear in school-children; their frequency and importance. *Wratschebnaja Gaseta*, No. 39, 1904.

381. VOSS. Deafness. *Die deutsche Klinik am Eingange des 20 Jahrhunderts*.

378. Two hundred and seventy patients were treated; the simple mastoid operation was performed in 23, the radical in 50; 49 operations were performed on the nasal accessory cavities. Of the 51 cases of chronic otorrhœa which were treated by operation, the radical operation was performed in 44. In only 9 cases did the disease begin after the fifteenth year; in the other 24 adults it had existed since childhood. As regards the indications for operation, in 16 the chronicity of the affection was the indication; in 20 there were also symptoms of retention; in none of these cases were there any external signs of mastoid involvement. In 8 cases there was a vital indication for operation, consisting in marked symptoms of retention, frequently with redness and swelling of the mastoid region. One of these cases died, a purulent meningitis setting in 15 days after operation. In 29 cases complete recovery occurred; in 10, recovery was only partial. In 3 there was necrosis of the labyrinth, in 16 cholestea-

toma. The hearing was improved after operation in 22, in 5 it was unchanged, in 6 it was diminished; in 10 no details were given: 1 died.

The report also contains the article of SCHMIEGELOW on the relation between diseases of the nose and of the eye, which has been published (*Verh. d. dan. oto-lar. Ver., Arch. f. Laryng.*)—also an article by Dr. Bentzen on "Stenosis of the Larynx."

JÖRGEN MÖLLER.

379. Of the cases reported, the following are of special interest: a hemorrhage into the labyrinth with Ménière's symptom-complex occurring after violent sneezing; epistaxis which could be controlled by no treatment until an application of 50 % chlorid of zinc was made. In chronic affections of the tube and of the middle ear the author has practised injections of a few drops of a mixture of adrenalin and of 5 % cocain solution into the tube. The results were favorable though transient; the hearing was improved and the noises diminished. PIFFL.

380. Three hundred and fifty-three scholars varying in age between ten and nineteen were examined. The examinations were made with Politzer's acoumeter and whisper. Those examined were divided into 5 groups: Group 1. Those who did not hear the acoumeter or whisper voice, or only up to a distance of 5m. These were 3 % for the acoumeter and 2.3 % for the whisper. Group 2. Those who could hear the acoumeter and whisper at a distance of 6-8m. These were for the acoumeter 5.5 %, for the whisper 3.8 %. Group 3. Ears which could hear acoumeter and whisper at a distance of 9-10m. These were 6.6 % for the acoumeter, and 5.4 % for the whisper. Group 4. Those hearing the acoumeter and whisper at a distance of 11-15m. These were 23.9 % for the acoumeter, and 81.8 % for the whisper. Group 5. Those who could hear the acoumeter or whisper voice at a distance of 16m or more.

The author deduces from these results important points in the prevention and treatment of ear diseases in school-children.

SACHER.

381. This is a general description of the causation, pathology, and treatment of deafness. HARTMANN.

b.—GENERAL PATHOLOGY AND SYMPTOMATOLOGY.

382. LANNOIS. Disturbances of hearing in herpes zoster. *Ann. des mal. de l'or.*, 1904, Sept.

383. HAIKE. Supplemental investigations on the action of salicylate of soda and of aspirin on the ear. *A. f. O.*, vol. lxiii., p. 78.

384. HABERMANN. On ear diseases following cretinism. *Ibid.*, vol. lxiii., p. 100.

385. LAKE. The influence of disturbances of the general health on ears which already are affected with mild lesions. *Arch. internat. d'otol.*, etc., vol. xviii., p. 737.

386. CHAUVEAU. A case in which mastoiditis and maxillary sinusitis disappeared during an attack of acute articular rheumatism. *Ibid.*, vol. xviii., p. 823.

387. COSTINIU. Examinations of the ears of railway employees in regard to their length of service in the company and the nature of the substance used in firing the locomotives. *La presse oto-laryngologique belge*, 1904, book ii.

388. DELIE. Tobacco and hearing. *Ibid.*, 1904, book ii.†

382. Herpes zoster in the distribution of the trigeminus, facial paralysis, and disturbances of hearing occurring in the course of cold and in infectious diseases is a well-known but rare symptom-complex of neuritis. It is not possible to determine whether in these cases the disturbance of hearing depends upon a lesion of the auditory nerve or on the facial paralysis (paralysis of the stapedius), or whether the auditory nerve can be affected in the course of a herpes zoster or not. These two cases show that in the course of herpes zoster of the neck and of the forehead without facial paralysis a disturbance of hearing occurred.

BOENNINGHAUS.

383. Following the experiments of Wittmaack, who has shown that the action of quinine does not consist in producing hemorrhages in the ear but in changes in the ganglion cells of the auditory ganglion, the author has taken the same course of investigation for salicylic acid and aspirin. The suffocation and dyspnoea in the animals treated with salicylic acid were avoided by killing the animal before the onset of the action of the poison, and by the use of artificial respiration the action of the poison was observed up to death. As a comparison, animals which had been suffocated and others which had been killed with strychnine were employed. In the latter, hemorrhages and hyperæmia were present. In the animals poisoned with salicylic acid this was not the case. Agreeing with Wittmaack, he found anatomic changes in the ganglion cells of the vestibular ganglion as well as in the spiral ganglion, which affected principally the Nissl bodies. In the auditory tract a degeneration of the medullated sheaths could be demonstrated.

384. Previously reported.

385. After giving six case-histories, the author draws attention to the well-known fact that disturbances of hearing of a light grade can be the result of bodily or mental fatigue, and can be cured by a general treatment. OPPIKOFER.

386. In one case mastoiditis, in another empyema of the maxillary sinus, were healed at the onset of an acute articular rheumatism. It does not, however, seem to us quite clear that the cure of these two affections was produced by the rheumatism. In the first case the patient, against the advice of his physician, undertook to travel, notwithstanding severe pain in the ear and tenderness of the mastoid process. When the articular rheumatism began, he was required to keep to his bed for a number of weeks, and then the symptoms in the ear disappeared. The rest in bed, and not the articular rheumatism, probably produced the favorable result.

In the second case, a case of empyema of the maxillary sinus of dental origin, the carious teeth were extracted but the cavity was not irrigated. Recovery nevertheless occurred. The possibility that after removal of the carious root of the tooth a dental empyema gradually recovers is not improbable—more probable than the supposition that the articular rheumatism caused the cure of the sinus affection. OPPIKOFER.

387. In Roumania locomotives were operated up to 1888 with wood and then with coal. Later with raw petroleum, and since 1896 with coal and raw petroleum together. All machinists and stokers complain of the intense noise which the raw petroleum produces during ignition, and believe that it injures the hearing, the sight, and the nervous system. The author has himself undertaken a number of experiments in various locomotives, and found that the noise of the burning petroleum was very marked, especially if the petroleum was used pure and when the coals were not evenly distributed on the gridiron. This noise, together with the other noises of the machinery and the variations in temperature, may easily aggravate an existing ear trouble. After a while, however, the changes in the drum and in the auditory nerve generally disappear. The disturbance of hearing depends more upon the age, and especially upon the time of service in the locomotive. BRANDT.

388. Previously reported.

C.—METHODS OF EXAMINATION AND TREATMENT.

389. QUIX. Determination of hearing with whisper-voice and tuning-fork. *Annales des maladies de l'oreille*, etc., 1904, Sept.

390. QUIX. Remarks on the papers of Professor Ostmann—"Figures of Vibration and Threshold Values," and "An Objective Hearing Measure." *A. f. O.*, vol. lxiii., p. 118.

391. OSTMANN. On examination of the hearing. *Deutsche med. Wochenschr.*, No. 50, 1904.

392. URBANTSCHITSCH. On the use of mirrors for intratympanic otoscopy. *M. f. O.*, 1904, No. 8.

393. SWERSHEWSKI. On the use of tigenol in the ear and nose. *Medicinskoje Obosrenje*, No. 7, 1904.

394. TREITEL. Two cases of massage of the stapes with Luca's pressure probe with good and permanent results. *A. f. O.*, vol. lxiii., p. 20.

395. BABINSKY. Lumbar puncture in diseases of the ear. *La médecine moderne*, No. 47, 1904.

396. GELLHAUS. On the inhalation of menthol in diseases of the nose and larynx. *M. f. O.*, 1904, No. 7.

397. THANISCH. A new apparatus for irrigating the attic. *M. f. O.*, 1904, No. 8.

398. STEIN. Operation on the mastoid process in scopolamin-morphin narcosis. *Hospitalstidende*, 1904, No. 43.

389. The errors caused by a partial guessing of words are to be avoided. It is therefore necessary, according to ZWAARDEMAKER and QUIX, to use only those words which have an accent and where individual vowels and consonants are heard at equal distances—*æqui-intensiv*, which depends principally on whether the fundamental tone and the speech tone have the same pitch—"isozonal." Three groups of words can then be arranged—high, middle, and low zone, as has already been shown by O. Wolf, not, however, observing the monosyllables and the same intensity of vowels and consonants. As the sound-tones in the various idioms are pronounced differently, each idiom must have its own words, and in this paper Quix has selected the words for the Dutch language, Reuter has selected them for the German language, and Delsaux intends to do so for the French. If we then compare, in disturbances of hearing, the loss in hearing as determined by the whisper and the loss in hearing as determined by the tuning-fork, we find a very satisfactory correspondence.

BOENNINGHAUS.

390. QUIX questions the correctness of the laws formulated

in the first paper of Ostmann, and declares that the tables in the last paper are incorrect.

HAENEL.

391. This is a clinical lecture for students, furnishing a clear picture of the quantitative and qualitative examination of the hearing, with special regard to the results obtained with the use of his objective audiometer. It may be of general interest that OSTMANN in one-sided ear disease recognizes in Rinne's experiment a decided diagnostic aid, which in recent years has frequently been attacked. Finally Ostmann states that he has recently found that the handle of a tuning-fork does not vibrate in a longitudinal but in a transverse manner, and that the threshold value amplitude for hearing through bone-conduction is very much less than for sound perception through the ear. He hopes that this will help us in discovering the peculiar transmission of sound in the skull.

NOLTENIUS.

392. The author recommends instead of a metallic mirror one made of glass, which is said to furnish a more perfect picture.

PIFFL.

393. In atrophic processes in the nose the author has not found a 10-20 per cent. salve to be of much value. The remedy, however, can be used to advantage in purulent diseases of the ear as it is anæsthetic and astringent. On prolonged application the mucous membrane may be irritated.

SACHER.

394. In two awkward cases of chronic suppuration of the middle ear with cicatricial fixation of the stapes, the author has obtained permanent improvement of the hearing with massage of the stapes. In the first case, the hearing distance is not given; in the second case, the whisper was heard directly at the ear before treatment was begun and after the treatment at a distance of 3-5m. In the third case, the stapes could not be located. On massaging the oval membrane, the hearing distance for the whisper-voice was increased from 0 to 10cm.

HAENEL.

395. BABINSKY has observed in diseases of the labyrinth, especially in Ménière's symptom-complex, a disappearance of the tinnitus and of the vertigo, with improvement in the hearing after repeated lumbar puncture.

OPPIKOFEK.

396. The author has obtained favorable results with the inhalation of menthol vapors by using an apparatus consisting of a tube by which the menthol vapor was directly applied to the larynx.

PIFFL.

397. This instrument is modelled after the pattern of an atomiser with a double bulb. The fluid is not vaporized, but is injected, by means of the tympanic canal, in a small stream into the attic. No assistance is required. PIFFL.

398. In the first two cases no unpleasant features occurred either during or after the narcosis. The third case, a boy of fifteen years old, however, presented the following difficulties: he received, four and two hours before operation, 0.0001 S. + 0.01 M., and one hour before, 0.0005 S. + 0.005 M. Although he had stood the two trial doses well, the respiration ceased, and the operation had to be abandoned. Later the cardiac action seemed also to weaken. Active attempts at resuscitation were successful. Two days later the operation was performed under ether narcosis. Asphyctic attacks occurred, and the operation was finished with difficulty. The author believes this patient was intolerant of all forms of narcosis. Three other cases are reported in which the narcosis was well borne, in two cases, however, with the addition of ether. JÖRGEN MÖLLER.

d.—DEAFMUTISM.

399. BEZOLD. Deafmutism and the instruction of deaf-mutes. *Deutsche med. Wochenschr.*, No. 48, 1904.

399. In a long paper, BEZOLD gives his experiences with the examination of the inmates of the Munich Deaf-Mute School, with the aid of his continuous-tone series from C₂ to g⁸, 16 to 50,000 double vibrations per second. According to the author, the figures of those children who become deaf or deaf-mute in the first years of life are much too small, because the parents do not recognize the true nature of the affection until in later years. In more than half of the cases deafmutism is acquired. Congenital deafmutism is more frequent in females. In later life, among all deaf-mutes, for 100 males there are only 83 females, because the boys are more frequently affected by diseases which lead to deafmutism than are the girls.

As regards etiology, direct transmission from parents to children plays a secondary rôle. Of very much more importance are consanguineous marriages. Of acquired deafmutism, cerebrospinal meningitis forms the greatest contingent—*i. e.*, in about half of the cases, scarlet-fever 18 %, measles 2.1 %, diphtheria

1.7 %, typhoid fever 1.3 %, pneumonia 0.9 %, whooping-cough and osteomyelitis 0.4 %, in Bezold's statistics of 233 cases.

Finally, acquired deafmutism is caused in 1.7 % by mumps, and 5.6 % by hereditary lues, 6.4 % by local middle-ear suppurations, and 3 % after accidents.

The examination of the inmates of the Munich Deaf-Mute Institution gave the following results: 19.7 % were born bi-laterally deaf, and 38.4 % possessed hearing remnants, so that they could be instructed from the ear. This led to the arrangement of special classes, who were instructed by the new method and learned a speech which was entirely different from that of the ordinary deaf-mutes, and could progress very much more quickly in their studies. The method, which consists in using the ear and the eye of the pupil, with the aid of a mirror, in order to acquire a more natural speech, should be more generally known. While the attempts of Urbantschitsch to awaken the auditory nerve by systematic hearing exercises should be given up as hopeless, at the same time he ought to receive the due of having first instituted systematic instruction from the ear.

NOLTENIUS.

EXTERNAL EAR.

400. HALASZ. **A dermoid cyst in the mastoid region.** *A. f. O.*, vol. lxiii., p. 141.

401. NEUENBORN. **Rudimentary deformed auricle, with one-sided facial paralysis after hypoplasia of the nerve.** *A. f. O.*, vol. lxiii., p. 113.

402. CHAVANNE. **On the use of collodion in relaxation of the drum membrane.** *La presse oto-laryngol. belge*, 1904, Book 10.

400. A tumor, as large as a hen's egg, situated in the mastoid process of a man, twenty-five years of age, was first taken to be an abscess, originating in the mastoid process. The tumor had, however, existed for one year, and consequently it was movable with the skin over the bone. The lack of pain and the absence of an ear disease proved the diagnosis of a new growth.

HAENEL.

401. The author considers the facial paralysis in this case to be the result of an unusually narrow Fallopian canal, which had retarded the nerve in its development. The loss of taste in the entire two-thirds of the corresponding side of the tongue and the paralysis of the palate show the site of the paralysis. The

auditory canal was shortened; the drum membrane partly atrophic; the hearing for whisper reduced to 10cm; Weber was lateralized to the affected side. HAENEL.

402. This was a case of acute purulent otitis, in a commercial traveller, both of whose drums were covered with collodion, on account of relaxation. An aurist had discovered a caries of the handle of the hammer, and had advised removal of the hammer. After irrigation, the membrane of collodion came out, and it was seen that the collodion deposited on the hammer had simulated the serous disease. The suppuration then quickly ceased. The author advises patients whose drums have been treated with collodion to be carefully observed. BRANDT.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

403. BELLIN. On the anatomy of the mastoid cells and their suppurations. *Annales des maladies de l'oreille*, etc., 1904, April.

404. HALASZ. A primary mastoidal otitis and caries. *M. f. O.*, 1904, No. 8.

405. GRADENIGO. On paralysis of the abducens nerve of otitic origin. *Annales des maladies de l'oreille*, etc., 1904, Août.

406. HAMMOND. The palliative treatment of acute mastoiditis and its limitations. *Jour. Amer. Med. Assoc.*, Nov. 26, 1904.

407. POOLEY. Fibroma of mastoid, auricle, and auditory canal. *N. Y. Med. Jour.*, and *Phila. Med. Jour.*, Nov. 26, 1904.

408. RICHARDSON. Button in the ear twenty-seven years. Deafness cured by its removal. *Amer. Medicine*, Sept. 24, 1904.

409. OPPENHEIMER. Two cases of mastoiditis with paralysis of facial nerve. Recovery of paralysis following operation. *Med. Record*, Sept. 10, 1904.

410. PACKARD. The value of early incision of the membrana tympani in the treatment of acute suppuration of the middle ear. *Med. News*, Sept. 17, 1904.

411. DAY, E. W., and JACKSON, C. Purulent otitis media complicating typhoid fever. *The Laryngoscope*, Oct., Nov., Dec., 1904.

412. MCCAW. Some interesting cases of mastoiditis, with remarks. *The Laryngoscope*, July, 1904.

403. This paper treats of the aberrant pneumatic cells, which extend very frequently in all directions from the mastoid cells into the neighboring bone. In 190 temporal bones the author found that these cells were very much more frequently present than has previously been known. Seven cases have been reported, which were observed during the last year, in which the operation

for acute suppuration showed the presence of these cells filled with purulent contents, which were situated partly over the auditory canal, partly below the facial nerve, and partly beyond and below the sinus. In the eighth case death ensued from meningitis, induced by a suppurating cell situated above the auditory canal in the posterior root of the zygoma, which had not been exposed at operation. The presence of these aberrant cells requires the systematic examination of the mastoid cells with a probe and the sharp spoon after the removal of the entire external cortices of the mastoid process.

BOENNINGHAUS.

404. A woman, fifty-five years of age, complained of pain in the right ear, vertigo, deafness; later a swelling appeared beyond the ear and an abscess was formed. The drum membrane was apparently unchanged. The view of the author that this is a case of primary mastoiditis will probably not receive much support. Furthermore, the belief of the author that a severe hemorrhage which occurred during the operation was the result of an injury of the jugular bulb by the sharp spoon through the carious folds of the tympanum will also probably not be accepted.

PIFFL.

405. After an observation of six personal cases and fifteen reported cases, GRADENIGO has found that in the course of an acute otitis media, with and without perforations, characterized, however, by an abnormal latent course, a rare but typical symptom-complex sometimes is present, which consists in the following symptoms: diplopia caused by paralysis of the abducens nerve, headache on the affected side, often complicated by other unquestionably meningitic symptoms. The termination in two cases was death from purulent meningitis. In nineteen cases recovery took place, which did not occur until after weeks' or months' duration, and then spontaneously. Gradenigo believes that this paralysis of the abducens nerve is the result of a meningitis, either purulent or serous in character. In other forms of meningitis, and especially the most frequent form, the tuberculous, abducens paralysis is usually present. It therefore seems that the abducens nerve is unusually vulnerable in basilar meningitis. That may be caused by the relatively small size and length of course of this nerve in the middle cranial fossa, or by the slight power of resistance of the abductors or extensors in general, as is well known in the larynx and in the extremities.

BOENNINGHAUS.

406. HAMMOND draws his conclusions from a study of 50 consecutive cases taken from hospital records during a period extending over six months, all admitted with the distinct diagnosis of acute mastoiditis. The incision of the drum was made in all cases where there was not a good opening. Rest in bed and Leiter coil were first employed. Thirty recovered without operation, 17 were operated on during their stay in the hospital, and 3 were discharged with apparent relief, but returned for operation. Three cases were exacerbations, and 3 with intact drums came to mastoid operation. The average duration of acute inflammation previous to the admission was about six days. Continuous purulent discharge with tenderness and swelling of the mastoid tissues, appearance of slight swelling in the canal, and in one case slight beginning facial paralysis decided the operation. In 4 cases absorption of the inner table and in 1 case an extradural abscess were found. Three cases without mastoid tenderness came to operation. M. TOEPLITZ.

407. A man, aged twenty-nine years, had thirteen years ago a growth removed from behind his ear and auditory canal, which had not returned until two months ago. POOLEY found a large elastic growth situated behind the ear, close to the attachment of, and extending for some distance on, the posterior surface of the auricle, of about the size of a pigeon's egg; also another filling the meatus and extending for some distance into the auditory canal, about the size of an olive. The latter was first dissected out with scissors as far back as possible, followed by considerable hemorrhage. The posterior tumor was fully exposed and found firmly adherent to the concha and posterior auditory canal, which was opened; the two wounds were then connected. After three days another growth was removed from the canal. The posterior wound then broke down and an abscess was collecting from the lobule. Through an incision at the angle of the jaw much pus was removed. The posterior wound continued to suppurate and the auditory canal refilled with tumor and granulations. After another incision and curettement the parts became phlegmonous. Labyrinthine involvement took place. However, treatment by the X-ray improved and finally cured the condition. The pathological diagnosis was fibroma, the clinical one of sarcoma. It was one of those recurring fibroid tumors without well-defined border-line of distinction between malignant and benign.

M. TOEPLITZ.

408. A man of thirty-two suffered from deafness in the right ear. $H = c/36''$. Much cerumen was found and removed. A small white spot was then discovered against the posterior wall of the bony canal just external to the drum, imparting a grating sensation to the probe. It was removed with the alligator forceps and was a pearl button covered with desquamated epithelium.

M. TOEPLITZ.

409. In two cases of chronic purulent otitis media in adults, which had lasted seventeen and six years respectively, a facial paralysis hastened the performance of the radical operation. After removal of carious bone and granulations and a sequestrum over the facial canal in one case, the paralysis was cured.

M. TOEPLITZ.

410. PACKARD emphasizes the following points in the treatment of acute suppurative otitis media: First, the great value of early incision of the membrana tympani, since there was almost instantaneous relief from pain, while after spontaneous rupture the pain continued to be intense for some days in spite of free drainage of the pus. Second, the many advantages possessed by the so-called dry treatment and by practising efficient gauze drainage. Douching out the ear by the patient or the nurse is contra-indicated, since only a skilful aurist can properly dry the ear afterwards.

M. TOEPLITZ.

411. The noses, throats, and ears of 208 patients with typhoid fever were examined on admission and at intervals afterward. Two cases of otitis externa circumscripta, 33 cases of the sound-conducting apparatus, among which 8 of acute catarrhal otitis media and 6 of myringitis. On surveying the literature, acute purulent otitis media was noted; among 780 patients of typhoid fever, in 88 cases (11.3 %), 45 (51.2 %) unilateral (26 left, 19 right), 43 (48.9 %) on both sides. Acute otitis media of typhoid fever is usually monomicrobial, the chronic form is polymicrobial. Pus from the middle ear in 22 cases showed staphylococcus aureus in pure culture four times, streptococcus in pure culture eight times, and these two in mixed infections six times. The pneumococcus was found twice; bacillus diphtheriae twice. In 7 out of 8 cases of streptococcus in ear pus it was found also in the naso-pharynx. Staphylococcus was here in all 10 cases found in the ear pus. The typhoid bacillus was not found in any case in either the naso-pharynx or the ear discharges. The naso-pharynges of 60 typhoid-fever cases were all found free

from infection with typhoid bacilli. The organisms found in the naso-pharynx were: Streptococcus, staphylococcus aureus, staphylococcus albus, pneumococcus and bacillus diphtheriæ. The two types of cases, the slow and the fulminating, after the end of about a week assumed the same gross pathological state; the difference was the rapidity of onset. In 4 cases of purpuric typhoid fever, the mucosa of the ear was seen to be spotted with blue-black discolorations in 1 case; in another it was slate-colored, blending to brownish-black and black anteriorly. Another case bled freely from the ear. An acute suppurative otitis media followed in all the hemorrhagic cases of whatever form. In 10 cases there was a small-celled infiltration into some of the labyrinthine tissues, in 3 primary, in 4 cases secondary from a necrosis of the inner wall. In 3 cases exuberant granulations pushed the drumhead out without pus, but were associated with dead bone. Two cases had necrosis of the long process of the malleus, 4 cases necrosis in the ossicles, 6 cases in the walls. Among 41 cases of typhoid fever in private rooms only 1 case of otitis media developed. There is a predisposing, if not an exciting factor in typhoid fever, which is not usually present in the first three weeks; 93 % of the purulent otitis media cases occurred after the twenty-first day, 8 % between the twelfth and twentieth days. Of 20 cases of typhoid fever which died before the twenty-first day, no ear suppuration was noted. Of 20 cases that died between the twenty-first and thirty-first days, 2 had suppurating ears. The predisposing causes are: Decubitus, swallowing in recumbent position, acute catarrhal disease in nose and pharynx, lowered resistance, increased virulence of organisms, tubal closure, abnormal patency of tubes, intensity of general infection, former perforation of drum, etc. The exciting causes are: Extension of continuity of disease, infection, thrombus, sloughing of purpuric areas, erysipelas. The symptomatology, diagnosis, prognosis, and treatment are fully considered. As to life, of 88 cases of purulent otitis media in typhoid fever, none was fatal through any complications of the ear condition. Two cases had suppurative involvement of the labyrinth, secondary to the otitis media; panotitis. The only two complications were erysipelas in 3 cases and mastoid empyema in 26 (29.5 %); mastoid tenderness without pus-formation in 31 % of the cases. Every purulent otitis case treated by elevation of the foot of the bed developed mastoid empyema: 4 cases, 1 uni-

lateral, 3 bilateral, with rapid destruction of bone and absolutely normal temperature for a week or more before the operation in 14 out of 26 cases. Where the temperature was high, there was pus in other locations or a re-infection of typhoid.

M. TOEPLITZ.

412. Case 2, in a man, aged thirty years, acute suppurative otitis media; double mastoiditis; operations; recovery. There was a profound septic condition with mental derangement due to absorption from the double mastoid. Case 4, in a man, aged eighty-seven years, acute suppurative otitis media dextra; mastoiditis; epidural abscess; meningitis; operation; death.

M. TOEPLITZ.

b.—CHRONIC MIDDLE-EAR SUPPURATIONS.

413. HEINE. On chronic purulent otitis. *Therapie der Gegenwart*, Oct., 1904.

414. SCHIRMUNSKI. On otolithiasis. *M. f. O.*, 1904, No. 8.

415. KRETSCHMANN. On the occurrence of suppurations in the hypotympanic recess. *A. f. O.*, vol. lxiii., p. 74.

416. JOURDIN. Diseases of the carotid canal and hemorrhages from the internal carotid in caries of the petrous pyramid. *Annales des maladies de l'oreille*, etc., Nov., 1904.

417. BELLIN. A case of hemorrhage from the carotid in tuberculous otitis. *Annales des maladies de l'oreille*, Oct., 1904.

418. FREY. On the new formation of bone in the middle ear in chronic suppurations. *A. f. O.*, vol. lxiii., p. 12.

419. GERBER. The absence of bone formation after operations on the temporal bone. *A. f. O.*, vol. lxiii., p. 134.

420. LUC. Siebenmann's plastic in the radical operation. *Annales des maladies de l'oreille*, etc., Nov., 1904.

421. CABOCHE. On the after-treatment of radical operations with boric acid, and on the resection of the posterior and upper walls of the membranous canal. *Annales des maladies de l'oreille*, etc., July, 1904.

422. KATZ. A case of labyrinth necrosis with sequestration of the entire cochlear plate by operation. *Berl. klin. Wochenschr.*, No. 40, 1904.

423. MCKERNON. A case of chronic purulent otitis media, complicated by chronic mastoiditis and jugular-bulb thrombosis; operation; death. *The Laryngoscope*, Dec., 1904.

424. DENCH. Plastic operations for the closure of the post-aural openings following radical and mastoid operations. *Four. Am. Med. Assoc.*, Nov. 26, 1904.

425. HEAD. The hot-water douche in the treatment of chronic catarrhal deafness. *Four. Am. Med. Assoc.*, Nov. 12, 1904.

426. ROY. **A case of bilateral tuberculosis of the middle ear in an infant.** *Four. Am. Med. Assoc.*, Nov. 12, 1904.

427. RANDALL. **The treatment of otitic septicæmia.** *Four. Am. Med. Assoc.*, Nov. 26, 1904.

413. An article, meant for the general practitioner, on chronic suppurations of the middle ear. HARTMANN.

414. In a girl, twelve years of age, suffering from chronic purulent otitis, a stone measuring $1\frac{1}{2}$ cm long by 1 cm broad and $\frac{1}{2}$ cm thick was found in the external auditory canal, which had probably been formed by a bone sequestration as a nucleus.

PIFFL.

415. In this case of chronic suppuration, disease of the floor of the tympanum resulted from a carious focus in the mastoid process, perforating into the lower part of the tympanum. The carious focus was entirely closed off from the healthy antrum.

HAENEL.

416. A report of fifty cases from literature and two personal observations where the wall of the carotid canal had been destroyed. Of these, forty cases with consecutive hemorrhage from the carotid, which furnishes the basis for an exhaustive article on the pathology and treatment of involvements of the carotid artery and of its bony wall in otitic processes. The most frequent cause is tuberculosis, rarely scarlet-fever, quite unusually lues, cholesteatoma, carcinoma. The symptom of exposure of the carotid canal is an apparent pulsation of the interior tympanic wall, or at least an unusual pulsation of the pus in the tympanum. Dehiscences of the canal would make similar symptoms. The symptom of opening of the carotid is of course a hemorrhage from the ear, more rarely from the nose and from the mouth, finally very severe, usually weak and intermittent at the beginning. In the presence of severe hemorrhage, the erosions of the carotid or of the sinus, usually the lateral sinus, are only to be thought of, of which eighteen cases are known. If the hemorrhage is not severe, as it frequently occurs in otitis with granulations, we should, however, think of the possibility of an erosion of the carotid artery or of the sinus. The treatment is an operative one if the general condition permits of an operation, because without operation death is sure to result. The most rational operation at the present day is the radical operation with or without ligation of

the carotid artery. In JOURDIN's case recovery took place after the radical operation with continued packing of the carotid artery without ligation. It is valuable to know even before operation whether the hemorrhage is taking place from the carotid artery or from the sinus. There are cases where the character of the hemorrhage is not distinctly arterial or venous. These are explained on compression of the vessels of the neck, when the hemorrhage from the carotid becomes feebler, while a hemorrhage from the sinus becomes more severe.

BOENNINGHAUS.

417. A typical case: a phthisical patient in the last stages with old otorrhœa, with repeated but moderate hemorrhages from the ear and mouth. Six weeks after the first hemorrhage, radical operation. In the following six weeks another severe hemorrhage. The internal carotid was ligated. Death from pneumonia. At autopsy perforating tuberculous ulcers at the bend of the carotid artery.

BOENNINGHAUS.

418. In two cases of chronic suppurations and cholesteatoma, extensive formations of exostoses were observed in the lateral surface of the horizontal semicircular canal, and a similar condition was also found in a macerated specimen of the Vienna collection, which presented a large destruction of bone, presumably from cholesteatoma.

HAENEL.

419. The sinus and dura of the middle cranial fossa remained exposed nine months after operation, on account of the wound cavity which was lined with epidermis but without any formation of bone. The observation is illustrated by a drawing.

HAENEL.

420. The external opening of the ear can be permanently enlarged so as to permit a survey of the entire field of operation after the radical operation, by prolonging the section of the membranous canal into the auricle according to Körner or Siebenmann. LUC has operated upon 16 cases with Siebenmann's Y-shaped section, differing, however, from Siebenmann in the following particulars: While Siebenmann incises the posterior auditory canal, Luc cuts through the posterior and upper junction. Siebenmann places both the branches of the Y in the concha in a direction up and back and down and below. Luc places these incisions directly backwards and forwards. Why this section has been modified is not explained, though after Luc's section the natural opening of the concha is more retained,

The author is satisfied with his results, as the dilating of the opening of the ear cannot be regarded as a deformity, perichondritis did not follow resection of the cartilage of the concha, objections which have frequently been made to this procedure. Siebenmann in 197 cases has never observed any unpleasant result from this step.

BOENNINGHAUS.

421. According to CABOCHE, after the radical operation recovery can be accelerated: First, by complete removal of the upper and posterior walls of the membranous canal, including the adjoining part of the concha, whereby the operation is made simpler, the flaps have no tendency to invert, and the opening into the ear is very large. It is important to remove part of the membranous canal at the beginning of the operation. Moure and Delsaux have also given up the formation of flaps. They, however, do not sacrifice so much of the membranous wall. Second, by daily insufflations of boric acid after the packing has been removed on the fourth day, according to the suggestions of Delsaux and Lermoyez. The reviewer can also recommend this form of after-treatment, because it is less irritating and makes the patient more independent of the physician.

BOENNINGHAUS.

422. A locksmith, twenty-four years of age, was operated upon on account of a chronic suppurative otitis of the right side (perforation of Shrapnell's membrane) with severe labyrinth symptoms (one-sided deafness, vertigo, vomiting, facial paralysis, fever, no subjective noises). Shortly after operation, the vomiting, vertigo, and facial paralysis disappeared. In the course of the after-treatment, a sequestrum was found in the depth of the middle ear. As the sequestrum did not spontaneously separate, a second operation was performed to remove the surrounding part of the bone, and after a few days the sequestrum could be removed with a forceps. It contained the cochlea. Rapid recovery.

MÜLLER (Stuttgart).

423. A boy, aged five years, had scarlet-fever seven months prior to his first presentation, with pain behind both ears during the first week, followed by bilateral otorrhœa, continuing profusely for six weeks, when the left ear ceased to discharge and had remained well. The right ear discharged intermittently ever since. During the cessation of the discharge of this ear the child was fretful, drowsy, constipated, had headaches, pain, and foul odor from breath; when the discharge set in again, the train

of symptoms cleared up. The right external meatus was filled with thick, foul-smelling pus. There was a double perforation of the drum, granulations sprouted through the upper opening, and on probing roughened bone was felt at two points. Examination of smears revealed mixed infection, with staphylococcus predominantly. An operation for the intratympanic caries was declined. After palliative treatment for one month, the boy was reported to have been apparently cured, but a month later the lower perforation had closed, the upper posterior still contained granulations, but somewhat contracted, and there was a slight thin discharge for three days. Three months later the discharge was much thicker, very offensive, darker, and quite profuse. The color of the boy was bad, the general condition impaired. The operation was consented to. Radical operation. Pus in antrum, tip, zygomatic root, and medullary spaces posterior to sigmoid groove. Bone between posterior canal wall, anterior surface of sigmoid groove, and downward to bulb soft and necrotic. Cheesy material, cholesteatoma, removed from epitympanic space. Skin graft over the entire middle ear and mastoid antrum. Posterior wound left open. For eight days the boy was doing well. On the morning of the eighth day, headache, photophobia, restlessness. Temperature 104.0°F. Vomiting. For the next seven days no change of condition; wound looked well. On the eighth day following the rise of temperature, drowsiness and irritability, pulse more rapid, pain in back of head and neck. Temperature 104.8°; pulse 130, weak and irregular. Exploratory operation: The bone covering the sigmoid sinus was removed from above the bend of the sinus to the jugular bulb. The bone was found softened below, and on removal a small cell filled with cheesy material, cholesteatoma. The dura of the sinus was dark, with lustre and easily compressed. On incision no blood issued, but a clot, nearly an inch long was removed from the torcular end; it was soft, gelatinous, with grayish particles of plastic material adherent to its surface. Free hemorrhage was established. Several pieces of clot of firmer consistency were removed from the bulb, but there was no blood current below. The internal jugular vein was ligated and resected. Several enlarged lymphatic glands were removed from the upper third. A hot saline injection was made into the bowels. The boy never regained consciousness, and died twenty-four hours after the operation, the temperature remaining stationary up to the time of death. No autopsy.

M. TOEPLITZ.

424. DENCH cuts a large tongue-shaped flap from the concha, dissecting out the cartilage, turning the tongue of integument upward and backward into the posterior opening and securing it in place by sutures. He then makes an incision from the upper margin of the posterior opening just behind the line of auricular attachment. The integument is then dissected up from the underlying soft tissues, forward over the posterior surface of the auricle, and backward over the skull for a considerable distance throughout the entire extent of the opening which it was desired to close. From the lower border of the original post-aural fistula two slightly divergent incisions were made down the neck, a tongue-shaped flap to be folded upward into the wound and attached anteriorly to the periosteum of the bony cavity of the mastoid. The margins of the wound of the neck were undermined and drawn together. In another case four flaps were formed: a tongue-shaped one, from the auricle turned upward and backward, another from the upper margin of the opening upward, a third in line of the auricular attachment downward from the lower margin, and a fourth from the posterior margin well inside to avoid the dura.

M. TOEPLITZ.

425. A number of patients have shown decided improvement in hearing and relief of tinnitus on using the hot douche, which is applied by means of the fountain syringe through a specially small tip or a straight glass medicine dropper, hung eighteen inches above the ear, the water being as hot as can be borne without burning.

M. TOEPLITZ.

426. A baby, six months old, suffered with a discharge from both ears. The mother had a line of tuberculous ancestors. The discharge from the left ear was offensive and two-thirds of the canal were filled with granulation tissue. The discharge from the right ear was slight, but purulent and offensive, and the canal contained granulation tissue. Slight signs of facial paralysis were on the left side. Discharge and granulations showed a large number of tubercle bacilli. In lungs, râles. The granulations were removed, but sprouted again. The baby died of tuberculous bronchitis.

M. TOEPLITZ.

427. In cases of tympanic involvement with a septic character, RANDALL urges, besides local treatment, general measures, especially the frequent and full employment of enteroclysis.

M. TOEPLITZ.

C.—CEREBRAL COMPLICATIONS.

428. ESPENSCHIED. On the relation between caries of the petrous pyramid and optic neuritis. *A. f. O.*, vol. lxiii., p. 1.

429. TENZER. On the condition of the eye-grounds in diseases of the ear. *A. f. O.*, vol. lxiii., p. 23.

430. STRATEJEWSKI. A case of brain abscess. *Chirurgia*, vol. xv., No. 89.

431. ALT. Two healed cases of cerebellar abscess. *M. f. O.*, 1904, No. 7.

432. RICHTER. Gangrenous pachymeningitis, and hydrogen peroxide to show the presence of blood. *M. f. O.*, 1904, No. 7.

433. MANASSE. On the operative treatment of otitic meningitis. *Zeitschr. für klin. Medizin*, 55 Band.

434. LERMOYEZ and BELLIN. On the surgical treatment of generalized purulent otitic meningitis. *Ann. des mal. de l'oreille*, etc., Oct., 1904.

435. TAPTAS. A case of thrombophlebitis of the lateral sinus. *Ann. des mal. de l'oreille*, etc., 1904.

436. BACON. A case of sigmoid sinus thrombosis; operation without ligation of the internal jugular vein; recovery. *N. Y. Med. Jour.* and *Phila. Med. Jour.*, Oct. 1, 1904.

437. BALL. Thrombosis of the lateral sinus following acute otitis media. *Amer. Medicine*, Sept. 17, 1904.

428. In the ear clinic in Tübingen, seventy-four cases of caries of the petrous pyramid were observed, in which a choked disk was present in two and neuritis optica in one. The author concludes as follows: hyperæmia of the optic nerves forms no indication for operation on the mastoid process, as in certain cases the condition disappears without operation. Pronounced optic neuritis or choked disk is only observed in severe cases, when operation must be undertaken on account of other threatening symptoms. The communication between the ear and the eye conditions occurs through the cerebral lymph, which receives the poisonous material from the purulent focus in the petrous bone, acts in an inflammatory manner on the papillæ, and causes a swelling on account of its increased tension. In the fatal cases, a bacterial leptomeningitis is usually the intervening condition. Though the affection of the optic nerve disappears after the healing of the focus in the temporal bone, the continued presence, increase, or even development of disease of the optic nerve does not of itself furnish an indication for a new operation, because these conditions are observed even when the course of the disease is favorable.

HAENEL.

429. TENZER has observed the material of the Charité Ear Clinic in Berlin during the last ten years as to the condition of the eye-grounds. In the frequent simple affections of the middle ear and of the mastoid process without intracranial complications, changes in the eye-grounds, usually of a mild character, were observed in only 5. Of the 7 cases with clinical symptoms of an intracranial disease without any evident anatomic condition (serous meningitis), 6 showed changes in the eye-grounds, and of these, in 5 optic neuritis or choked disk was present. In 76 cases where intracranial complications were added to the ear condition, as was shown by operation or autopsy, the following table shows that in 12 cases complicated with cerebellar abscesses changes in the eye-grounds were found present in 9. In 14 cases with cerebral abscesses, changes were observed in 7; in 31 cases of purulent meningitis, in 11; in 19 cases of extradural abscesses, in 5; and in 35 cases of sinus thrombosis, in 9. Intracranial complications of every kind and description may be present without producing changes in the eye-grounds—in fact a normal eye-ground is more frequent. The ophthalmoscopic condition does not enable us to conclude on the kind of intracranial disease. The eye-ground changes may appear at any time—as early symptoms before the onset of clinical symptoms, at the acme of the disease, and finally before the removal of the focus by operation. The changes of the eye-grounds are usually doubled-sided, though they may sometimes be limited to one side and that the unaffected side. The course and termination cannot be prognosticated from the condition of the eye-grounds.

HAENEL.

430. A woman, forty-two years of age, was operated upon who had been taken ill, after an otitis, with violent symptoms of a brain abscess. After operation, an improvement, which lasted for four days. Then suddenly her condition grew worse, with fever, unconsciousness, and death after a few days. No autopsy.

SACHER.

431. Of these two very interesting cases which were healed by operation, the first was that of a man, thirty-one years of age, with chronic purulent otitis and cholesteatoma, who had suffered from headache and fever but without any symptoms pointing to an affection of the cerebellum. A necrotic area of bone situated posteriorly to the sigmoid sinus led to the diseased dura and the exposed cerebellar brain substance, which was eroded to the depth of $\frac{1}{4}$ cm.

The second case was a man, seventy years of age, who was taken ill with acute purulent otitis, vertigo, and headache. At operation, at the inner side of the sinus there was a fistula in the dura, which led to an abscess as large as a walnut. The examination of the eyes in the first case showed choked disk, in the second normal condition but with horizontal nystagmus.

PIFFL.

432. Within an interval of from two to three days a young man, seventeen years of age, suffering from chronic purulent otitis developed very threatening and unusual symptoms. There were an abscess of the right half of the head, extending from the auricle to the medial line of the occiput, two abscesses in the auricle, an abscess in the neck down to the sternum, and pachymeningitis which extended to nearly the depth of the petrous pyramid, where the dura was of a greenish-brown color and separated from the bone. After extensive opening of the abscess and exposure of the dura, the process was brought to a standstill and the case recovered. The author is inclined to regard hydrogen peroxide as of service in showing the presence of blood.

PIFFL.

433. Two cases of meningitis healed by operation are reported.

1. A man, forty years of age, with chronic suppuration presented symptoms of brain irritation. At operation an extradural abscess was found in the posterior cranial fossa. Notwithstanding evacuation of this abscess, the symptoms grew worse—four days later, distinct meningitis, fever, rigidity of the neck, tension of pulse, complete coma. Puncture of the meningeal sac through the exposed dura evacuated a large quantity of clouded, serous, yellowish fluid. Repeated punctures evacuated about 15ccm. Microscopic examination of the fluid revealed pus corpuscles, diplococci, and bacteria coli. Improvement on the following day. Continued escape of cerebro-spinal fluid. Punctures were repeated with the same result. The dura was incised. Continuous escape of cerebro-spinal fluid with improvement. On the third day, return to consciousness, pulse and temperature became normal, and the rigidity of the neck disappeared. Recovery.

2. A girl, eleven years of age, was operated on for a thrombosis of the lateral sinus and jugular bulb after acute suppuration. After operation, gradual onset of symptoms indicating

intracranial complications, fever, restlessness, headache, increased reflexes, somnolence, and optic neuritis. Puncture of the cerebellum showed increase of cerebro-spinal fluid. In the clear fluid there were flocculæ which proved on examination to consist of brain debris. Then immediate improvement. On the following day repetition of the puncture. Recovery.

The case, according to the author, is regarded as one of serous meningitis with encephalitis. The latter diagnosis is based on the microscopic presence of brain tissue.

In another case, the symptoms of meningitis, rigidity of the neck, somnolence, disappeared after the radical operation, with a disintegrated cholesteatoma but with normal dura.

Following these observations, MANASSE recommends in the presence of symptoms of meningitis the first operation on the temporal bone including complications. If the symptoms continue, puncture of the meningeal sac through the exposed dura should be made, if successful to be repeated daily. If this does not succeed, the dura is to be broadly opened. Finally this step can be combined with lumbar puncture. HOELSCHER.

434. An otitic meningitis. The source of infection should be excluded by the radical operation and the dura extensively exposed. If this simple step is unsuccessful, the dura and the arachnoid should be incised and lumbar puncture repeatedly made. The authors recommend this active procedure because they have observed two successful cases of meningitis which were treated in this manner. The authors, however, are not correct in regarding these cases as purulent, or as generalized purulent, meningitis. For even if the lumbar-puncture fluid is purulent or clouded through by leucocytes, this sediment of the subarachnoid fluid in the lowest part of the lumbar sac does not prove that the fluid in the spinal subarachnoid spaces is purulent. It may be only sero-purulent or serous, and the second case (purulent lumbar fluid on escape of fluid after incision of the dura and puncture of the brain, existing under pressure) appears to be a case of serous ventricular meningitis.

BOENNINGHAUS.

435. A very interesting case. An old suppuration; headache for ten days, vertigo, vomiting, fever with sudden fall. Radical operation: cholesteatoma; the wall of the sinus and surrounding dura discolored, sinus flattened and empty, the jugular vein nevertheless ligated; the sinus broadly opened; with curette

blood coagula are removed from above and below, followed by hemorrhage; no improvement. Three days later, broad crucial incision in the cerebellar dura mater. Immediate prolapse of brain with puncture negative, immediate beginning of convalescence. The case demands a different explanation. The strong intracranial pressure, which was not regarded by the author, proven by the compression of the sinus and the immediate prolapse of the brain after incision of the dura, can only be regarded as acute serous meningitis. From the fact that convalescence immediately began after incision of the dura, and as no serum escaped externally, the case was probably one of an acute inflammatory hydrocephalus of the ventricles, where the fluid escaped in the subarachnoid cavity after the prolapse had furnished more room within the skull (see my monograph on *Acute Serous Meningitis*, Wiesbaden, 1897, pp. 67 and 91). The blood coagula were not red, consequently not inflammatory thrombi, and resulted from the stasis in the neighborhood of the bulb and of the torcular.

BOENNINGHAUS.

436. A woman, thirty-three years of age, had four years ago been successfully operated upon for an acute mastoiditis of the right ear due to influenza. The present trouble was an acute mastoiditis of the left side, for which she was also operated upon. A perforation was found in the bone filled with pus. The sigmoid sinus was covered with granulations, the sinus wall found healthy, but was accidentally injured. Owing to septic temperatures the sinus was again exposed ten days after the mastoid operation and found closed in lower portion from a thrombus forming at the bulb. The return flow of blood was restored by the curette.

Recovery.

M. TOEPLITZ.

437. A debilitated woman, aged twenty-eight years, was seized with an exudative streptococcus tonsillitis, the exudate white, mushy. A week later an acute otitis media set in in the left ear. An incision of the drum was followed by suppuration with streptococci. Intermittent temperatures continued. Another incision was made, tenderness over the mastoid was felt, but the operation was delayed. A few days later swelling behind the auricle appeared with increase of temperature, severe chill, and fall of temperature from 106° to 100°F. The mastoid was opened, a few cells found diseased, but the sinus was not exposed. After twenty-four hours, another chill, lasting fifteen minutes, occurred, with temperature 107°, falling to 98.4°; pulse

114. On the third day, another chill. On the fourth day, the sinus was explored, a broken-down, soft, purulent clot was found, and one drachm of pus escaped. No flow was established from below. On the following day, slight chill; pulse 130. On the next day chill, lasting forty minutes; temperature 105°, pulse 160. Ligation of jugular, which did not contain any thrombus. The temperature continued a septic course. The left elbow joint was swollen. Death ensued after six days, three weeks after the onset of the otitis media.

M. TOEPLITZ.

NERVOUS APPARATUS.

438. DAVIDSON and WESTHEIMER. **On a case of tabes with involvement of the larynx and of the labyrinth.** *Deutsche med. Wochenschr.*, No. 47, 1904.

439. HOLSCHER. **On Ménière's symptom-complex.** *Med. Cor.-Bl. d. Württ. ärztl. Landesvereins*, 1904, No. 34.

438. A waiter, forty-two years of age, who suffered from tabes, exhibited for a number of years the symptoms of tabes, consisting in gastric crises, continuous hoarseness, and gradually progressive deafness. The hearing in the diseased ear is now completely extinguished. The deep tuning-forks were not perceived at all by air-conduction; f⁴ sharp was only heard for a very short time and as well with the ear closed as open; C was not perceived from the left mastoid process, but was heard from the forehead and vertex. The author concludes that this deafness was due to disease of the labyrinth, as has already been described by other authors.

NOLTENIUS.

439. A typical case in an officer twenty-nine years of age. Apoplectiform onset. General improvement with subcutaneous injection of pilocarpin, hot baths, wet packs, iodid of potash, and gray ointment. The treatment had not been concluded at the time of publication.

MÜLLER.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY.

440. GLAS. **On intra-epithelial glands, cysts, and groups of leucocytes in the human nasal mucus.** *Arch. f. Laryngologie*, vol. xvi., No. 20.

441. LERMOYEZ. **The functional insufficiency of nasal respiration and education for nasal respiration.** *Ann. des mal. de l'oreille*, 1904, Sept.

440. The author has examined 120 tumors, polypi, and turbinal hypertrophies of the nasal mucosa for the presence of intra-epithelial glands. The specimens were obtained in the University clinic of Professor Chiari. In twelve cases typical intra-epithelial glands were found, in accordance with Zarniko and Boenninghaus and opposed to the negative findings of Cordes. The condition is defined and the results are described.

ALBANUS.

441. The author had previously published a case of an hysterical patient where it had been impossible to breathe through a normal nose because the patient said it was impossible. Another case is now described in a young girl twenty-one years of age, not hysterical, where this impossibility of breathing through the nose consisted in the faculty of breathing having been lost after a protracted coryza. Systematic exercises in breathing with closed mouth resulted in recovery after four brief sessions. The author thinks that these exercises should also be followed by children who, after pharyngeal tonsils have been removed, do not breathe properly notwithstanding an unimpeded nose; that thereby more will be accomplished than by the usual advice of the parents to keep the mouth shut, and the wearing of a mouth-bandage during the night.

BOENNINGHAUS.

b.—OZÆNA.

442. TREITEL. At what age does ozæna first show itself? *Arch. f. Laryngol.*, vol. xvi.

443. BOBONE. Petroleum in the treatment of ozæna. *Arch. internat. d'otol.*, etc., vol. xviii., p. 890.

442. The literature is first reviewed. The author has observed ozæna in a child four years of age, and in a brother and sister of six and eight years of age respectively, whose mother also suffered from ozæna. The mother declares that her father had suffered from a similar trouble.

ALBANUS.

443. The application of petroleum on account of its bactericidal and stimulating effects is recommended as a curative agent against ozæna. The number of cases which have been treated is not given. The patients who had been released from treatment had to continue the applications, and as these patients did not again call upon the physician, the author draws the rather questionable conclusion that these patients, at least the majority of them, were definitely cured.

OPPIKOFEK.

c.—TUMORS.

444. LERMOYEZ. Nasal tumors from Penghawar. *Ann. des mal. de l'or.*, etc., 1904, April.

445. RÖPKE. On endothelioma of the nasal cavity. *Münch. med. Wochenschr.*, No. 33, 1904.

446. LERMOYEZ. A case of carcinoma of the ethmoid bone. *Ann. des mal. de l'or.*, etc., 1904, July.

444. After nasal operations, LERMOYEZ is in the habit of introducing Penghawar fibres into the nose to arrest the hemorrhage, because they can be introduced without pain and are easier to remove than gauze plugs. He, however, has observed that after their use small granuloma, as large as beans, consisting of giant cells, developed at the site of operation, which evidently were due to some Penghawar fibres which remained in the nose and were surrounded by granulation tissue.

BOENNINGHAUS.

445. RÖPKE reports a case which he has observed, and, after reviewing previously published observations, concludes that endothelioma of the nasal cavities furnishes a bad prognosis. The patients can, if they come early enough to operation, in favorable cases, survive for a shorter or a longer length of time. It is difficult to prevent recurrences, owing to the extensive and inaccessible system of cavities in the nose and its accessory cavities. The most usual termination is death, following perforation of the tumor into the cranial cavity.

HARTMANN.

446. By the only suitable method of broad exposure from the outside, the author removed a large carcinoma of the left ethmoid bone in a man forty-three years of age. The operation consisted in a cutaneous incision along the side of the nose, then a resection of the frontal process of the maxilla and of the nasal wall of the orbit. The tumor was situated favorably, inasmuch as the bony walls of the nasal cavity, especially the lamina cribrosa, which is usually invaded early, were intact. Though no relapse occurred within one and a quarter years, a definite recovery cannot be concluded, but it is nevertheless a very favorable result, notwithstanding the usually bad prognosis in these very malignant tumors.

BOENNINGHAUS.

d.—DISEASES OF THE ACCESSORY SINUSES.

447. HENRICI and HÄFFNER. Do suppurations of the accessory nasal cavities produce a contraction of the visual field? *Münch. med. Wochenschr.*, No. 49, 1904.

448. FRIEDRICH. The diagnosis and treatment of suppurations of the maxillary antrum. *Deutsche med. Wochenschr.*, No. 50, 1904.

449. LAURENS. Surgery of the frontal sinus. *Ann. des mal. de l'or.*, etc., 1904, June.

450. TAPTAS. My method of operating radically on the frontal sinus. *Ann. des mal. de l'or.*, etc., 1904., Sept.

451. GERBER. Rhinogenic cerebral abscess. *Arch. f. Laryngol.*, vol. xvi., 1904.

447. Of 37 patients with disease of the accessory cavities of the nose, 36 showed a normal visual field. The contraction was found in one case, which was not certain. SCHEIBE.

448. This is a clinical discourse on the diagnosis and treatment of empyema of the maxillary antrum. No new view-points are furnished. On two points, however, the author seems to have an opinion which varies from the usual one: first, he does not employ the diagnostic puncture of the Highmore cavity with aspiration of the field, and, secondly, it would seem in most cases impossible to thoroughly eradicate the diseased ethmoid cells from the maxillary antrum which is wide open. In these cases the ethmoid labyrinth should be broadly opened by an operation from the outside. NOLTENIUS.

449. Based on seventy-one operations, the author relates his experiences in the surgery of the frontal sinus. 1. In uncomplicated cases he operates according to Luc-Ogston: incision in the eyebrow, opening in the area of disease, *i. e.*, above and to the side of the nose. Curettage of the cavity, especially of the nasofrontal duct. If the sinus be large, another small opening is made, up and externally from the first, in the roof of the orbit. This latter opening is made also in those cases where the sinus is not found from the first opening. Forty cures are reported from this simple and non-deforming method. 2. In complicated cases, *i. e.*, when the walls of the sinus are diseased, when other complications are present, or when after method 1 no healing takes place, the so-called sinusectomy is made, consisting in the removal of the entire anterior and lower wall of the sinus, to obliterate the sinus, just as Killian does, except that the orbital ridge is included. Twenty-nine recoveries are reported; two deaths from meningitis and cerebral abscess. This operation gives a poorer cosmetic result than Killian's method. It is, however, easier to perform and seems to be always successful.

BOENNINGHAUS.

450. The principle is the same as the radical operation of Killian, which is now practised universally in Germany. A broad opening is made between the nose and the frontal sinus. This is obtained just as Killian does, by resection of the frontal process of the superior maxilla, together with the anterior ethmoid cells, including the middle turbinal. With right the author claims priority for this part of the operation. Obliteration of the cavity is obtained just as by Killian, whose method, however, is unknown to the author, by total resection of the anterior wall. TAPTAS preserves the floor of the frontal sinus, which Killian removes, and does not preserve the supraorbital ridge. Twelve cases were healed without any degree of deformity. The certainty of recovery seems to be the same in this method as his. If we except the similar cosmetic result, which can be obtained in any case by the use of paraffin, Kuhnt-Taptas's radical operation is easier to perform than the Killian-Taptas operation. The question, however, remains, whether an obliteration in the ordinary cases without caries is necessary, and whether in the turbinal sinus, just as in the antrum of Highmore, a simple curetting after a broad communication with the nose—in other words, a Luc-Ogston-Taptas operation—is not sufficient. BOENNINGHAUS.

451. After influenza an empyema of the left frontal sinus. The mucous membrane was found degenerated and polypoid; pus. After operation the symptoms were all relieved. Two weeks later a painful swelling over the right frontal sinus. Temperature 38.9° C. On examining the nose there was no pus. One week later, operation on the right frontal sinus, whose anterior bony wall was found necrotic to a considerable extent. The sequestra, consisting of this anterior wall, the degenerated mucous membrane, and the carious frontal septum, were removed. Moderate quantity of pus. Frontal ethmoidal cells filled with pus were exposed. After several days, again a rise of temperature. A third operation. Exposure and eradication of the temporal recesses of the cavity. Softened posterior wall of the right frontal sinus was curetted with a sharp spoon. Pus appeared from the depth. The discolored dura was exposed. After incision the brain was punctured without result. At first, improvement, then headache, with slow pulse. The brain was again explored, and an abscess in the frontal lobe of the brain was evacuated. Death after four days. The author believes that the cause for this intracranial extension is to be found in the fact

that the empyema in the left frontal sinus was closed off. Bacteriological examination showed staphylococci and streptococci.

ALBANUS.

e.—OTHER DISEASES OF THE NOSE.

452. BLOEBAUM. The radical treatment of rhinophyma with galvano-caustic. *Munch. med. Wochenschr.*, 1904, No. 52.

453. LUBLINSKI. Accidental vaccination of the nasal mucosa. *Munch. med. Wochenschr.*, 1904, No. 52.

454. JAURASZ. Some rare and remarkable affections of the upper respiratory organs. *Arch. f. Laryngol.*, vol. xvi., 1904.

455. LOMBARD and BOURGEOIS. A modification of the submucous resection of the septum of the nose, after Petersen. *Ann. des mal. de l'or.*, etc., Oct., 1904.

452. The tumors were removed with the galvano-cautery snare and knife, the parts which were not thickened were punctured, and all unevenness smoothed with the flat burner. The after-treatment was continued for four weeks. The photographs of the case before and after operation show a very good result, although of course the form but not the color is given.

SCHEIBE.

453. A woman, who had not been revaccinated and who had frequently suffered from epistaxis, made use of a pocket-handkerchief with which she had dried the vaccine pustule of her child. Two pustules appeared on the lower and anterior extremity of the septum. The course was an eventful one. Three cases of vaccine pustules on the nose have been reported up to the present time.

SCHEIBE.

454. 1. In a patient, fifty-seven years of age, who had applied for treatment on account of a moderate nasal occlusion, a fully developed supernumerary eye-tooth was found protruding from the floor of the nose. It was easily removed.

2. A girl, fifteen years of age, suffered from moderate difficulty in swallowing and the sensation of a foreign body in the throat. A pedunculated smooth, thick polyp hung down beyond the soft palate from the naso-pharynx down to the region of the epiglottis. The insertion was near the pharyngeal tonsil. Microscopic examination of the removed part revealed that the tumor was composed of the lymphatic tissue of the pharyngeal tonsil.

3. A woman, twenty-nine years of age, in the last month of pregnancy, experienced slight difficulty in swallowing, but without fever; grayish-white pseudo-membrane on the surface of the

entire naso-pharynx. Nose, throat, and larynx were normal. The membrane contained diphtheria bacilli in pure culture. This case was similar to the way in which fibrinous or croupous rhinitis occurs in the nose. After a short time it was found to have disappeared without leaving any trace.

ALBANUS.

455. The authors operate under an adrenalin anæmia in chloroform narcosis. This is not necessary, because an anæsthesia composed of cocaine and adrenalin is sufficient. If the osseous septum has to be resected, the connection between the vomer and the floor of the nose is first destroyed, and then the vomer is broken off with the forceps. The chisel, which complicates the operation, can generally be dispensed with, as the forceps are sufficient. The authors in general endeavor to retain the mucous membrane on the convex surface. That is perfectly natural nowadays with the aid of adrenalin. The mucous membrane can be sacrificed if it is found that its separation is difficult—for instance, in the presence of sharp edges, scars, and adhesions. This standpoint is correct; then the loss of the flap has the only disadvantage of prolonging the recovery, but does not lead to any permanent untoward effect. The operation should not be called Petersen's, but more properly Hartmann-Petersen's.

BOENNINGHAUS.

f.—NASO-PHARYNX.

456. DELSAUX. **Adenoid vegetations and contra-respirators.** *La presse oto-lar. belge*, 1904, book ii.

457. EERRERI. **On post-operative torticollis in adenoid patients.** *Arch. internat. d'otol.*, etc., vol. xviii., p. 744.

458. LUNIN. **A tumor of the naso-pharynx.** *Protokolle des deutsch. ärztl. Vereins zu St. Petersburg, Sitzung am 8 März, 1904.*

459. WOLYNZEW. **On operative treatment in opening the naso-pharynx with rhinotomy and resection. A new procedure to open into the naso-pharynx.** *Chirurgija*, vol. xiv., No. 84.

456. The result of the not infrequent relapses after the removal of adenoids is due, according to the author, to a neglect of the after-treatment from the side of the nose. The nasal cavities are to be treated for the space of several months. The ventilation of the nose and restoration of the nasal respiration are often due to a poorly fitting mouth obturator. In every case the author has an obturator made from an exact impression of the

teeth, so that it fits just as exactly as a set of false teeth. Twice a day after the obturator has been inserted, exercises in nasal respiration are followed. Under this treatment the chronic cold in the head rapidly gets well.

BRANDT.

457. The author observed torticollis in two children after Gottstein's operation, which disappeared after one week in both cases. The lymph vessels passing from the pharyngeal tonsil communicated to a certain degree with the lymph nets situated underneath the sterno-mastoid muscles. If this deep-seated set of vessels is infected, the inflammation extends to the muscles, which then contract.

OPPIKOFER.

458. The specimen of a tumor of the naso-pharynx described was obtained at the autopsy of a boy four years of age. The boy had only been ill one and a half months. He presented on admission to the hospital all the symptoms of a malignant tumor of the naso-pharynx: rapid growth, loss of nasal respiration, dislocation of the soft palate forward and under, enlargement of the neck glands, and affection of the general system. The tumor originated from the base of the skull and occupied the entire naso-pharynx. It is of interest in this case to say that though the clinical picture undoubtedly was that of a malignant tumor the microscopic examination with certainty denied the malignancy of the tumor.

SACHER.

459. WOLYNZEW resects the superior maxilla on the opposite side to the diseased part of the naso-pharynx and recommends the operation as furnishing an extended field of operation. Resection of the upper jaw is practised by an incision which passes along the right of the nose and divides the upper lip in the median line. The resection is performed with the Gigli saw.

SACHER.

PHARYNX AND MOUTH.

460. FINDER. A peculiar condition of the posterior pharyngeal wall. *Arch. f. Laryngol.*, vol. xvi., 1904.

461. ONODI and ENTZ. On keratosis pharyngis. *Ibid.*, vol. xvi., 1904.

462. SACK. A severe case of mixed infection in the pharynx. *M. f. O.*, 1904, No. 8.

463. KLUG. Retro-pharyngeal abscess; erosion of the carotid artery; death. *Annales des maladies de l'oreille*, etc., 1904, Juli.

464. GURICH. On the relation between affections of the tonsils and rheumatism. *Münchn. med. Wochenschr.*, 1904, No. 47.

465. KÖNZEL. Purulent peritonitis following acute tonsillitis. *Ibid.*, 1904, No 43.

460. A patient, forty-five years of age, who was being treated on account of asthma and hoarseness, presented on his posterior pharyngeal wall very many pointed, yellowish-white nodules which protruded beyond the level of the mucous membrane. The intervening part of the mucous membrane was smooth, thin, pale, and dry. The condition continued towards the nasopharynx and increased in the direction of the larynx. No symptoms. No inflammatory signs. The microscope revealed that these nodules consisted of round and oval structures whose nature could not be determined. They gave the impression of being the product of some unknown retrogressive metamorphosis. A colored plate accompanies the article. ALBANUS.

461. This disease consists in a thickening and keratosis of the epithelium—in other words, a metaplasia accompanied with moderate inflammation of the connective tissue. The keratosis of the epithelium is not produced by keratohyalin or eleidin granules. The brownish discoloration of the epithelial plugs is partly from the original yellowish-brown color of the horny substance and partly from blood extravasates which are situated between the layers of epithelium. The disease develops upon a chronically inflamed base. The presence of leptothrix is purely accidental. It is in no relation with the disease. The authors suggest abandoning the word pharyngomycosis and prefer the term keratosis pharyngis for the milder cases; in the severe cases with prickly cells, the term suggested by Siebenmann, hyperkeratosis pharyngis. ALBANUS.

462. A child who had become infected with lues by the wet-nurse was taken ill in the eighth year with deep ulcerations in the left tonsil, the uvula, the palatal arches, and the posterior pharyngeal wall. Bacteriological examination revealed Vincent's bacilli, hence the diagnosis of angina ulcerosa. As every treatment was without result, mercury was administered and immediate improvement began. The authors, therefore, are inclined to regard this case as one of a mixed infection. PIFFL.

463. A child, suffering from a left-sided otorrhœa with mastoid fistula, suffered, after an attack of scarlet-fever, with a retropharyngeal abscess, which was incised. On the following day the child bled to death from the mouth. At autopsy, in the abscess cavity, which extended over the left half of the neck between the base of the skull and the hyoid bone, the carotid was found exposed and eroded. In the left middle ear there was a sequestrum

which contained the outer wall of the carotid canal. The supposition of KLUG that the abscess was a gravitation abscess from this bone focus seems probable. Perhaps the microscope might have shown both processes to be tuberculous in nature, inasmuch as there was a general acute miliary tuberculosis. The supposition, however, is not probable because (1) a detailed examination of the temporal bone was not made, which would have shown a connection between the ear and the abscess, and (2) the glands of the neck and of the axilla were very much swollen from the scarlet-fever, so that the abscess may have been the ordinary postscarlatinal phlegmon of the neck. BOENNINGHAUS.

464. Of 17 cases of acute articular rheumatism, 12 developed inflammation of the tonsils, 4 of these with peritonsillar abscesses. In 14 of these cases tonsillar plugs could be observed. The author recommends treating relapsing articular rheumatism with removal of the tonsillar plugs and reports favorable results in a few cases. SCHEIBE.

465. At autopsy, in addition to peritonitis, both tonsils were found as large as walnuts, pale grayish-red in sections, with granular surface. The peritoneal exudate as well as the tonsillar gave a pure culture of streptococci, while the bacterium coli was found in the appendix, the tube, and the uterus, and bacilli of various kinds in the intestines. SCHEIBE.

BOOK REVIEWS.

III.—**Coakley's Laryngology.** A Manual of Diseases of the Nose and Throat, by C. G. COAKLEY, Professor of Laryngology in the University and Bellevue Hospital College. New (3d) Edition. 12mo. pp. 594. Cloth \$2.75 net. Lea Brothers & Company, Philadelphia. 1905.

The preface to this new (3d) edition states that Chapter VII. on Diseases of the Accessory Sinuses has been entirely rewritten. We find that it now occupies fifty pages, and that this important subject is presented in a very clear and practical manner. According to Dr. Coakley, transillumination is a valuable aid in diagnosis, but not infallible. The value of a skiagraph for showing the presence and outline of a frontal sinus is mentioned. In the operative treatment of chronic suppuration of the maxillary and frontal sinuses we must differ with the author in a number of particulars. The only operation described consists in the total removal of the anterior or external wall of the sinus, complete eradication of the mucous membrane, then attempting to get total obliteration of the cavity by the formation of granulations. No mention is made of the impossibility of obtaining total obliteration of a bony-walled cavity by granulations in many cases, granting that obliteration is essential, which is still an open question, and no account is taken of the subsequent deformity which would result in the case of the frontal sinus. We have in the Caldwell-Luc operation for the maxillary sinus, and the Jansen, Kuhnt, or their combination, the Killian operation for the frontal sinus methods, which are much better and nearly ideal.

We are quite certain that this part of the book will again be rewritten for the next edition.

A. K.

Die Ohrenheilkunde der Gegenwart und ihre Grenzgebiete (Modern Otology), appearing in the form of Monographs,

edited by Professor O. KOERNER and published by J. T. Bergmann, Wiesbaden, has received the following three accessions during the past year:

IV. **Die Otosclerose** (Sclerosis) by Professor A. DENKER, Erlangen. 1905.

This monograph of 135 pages gives a careful review of our present knowledge of this interesting, though from a therapeutic standpoint most unsatisfactory, disease. In the introduction, otosclerosis is defined as a disease-entity, where, with a patent Eustachian tube and normal drum, clinically there is progressive deafness, and the functional examination shows definite and characteristic peculiarities. The pathological changes consist in a bony ankylosis of the stapes and rarefaction of the bony labyrinth capsule.

This affection includes only the primary forms of labyrinth involvement, agreeing with the teachings of Bezold, as opposed to the forms secondary to chronic middle-ear affections.

After introductory chapters on the normal anatomy and physiology of the parts involved, nearly half of the book is devoted to a description of the pathological changes. The cases in which the diagnosis was made *intra vitam* and later were examined with the microscope number 27, and are reported in detail with text illustrations. As to the etiology, the various theories are given, but the question is still open. Statistics show that female patients preponderate; the rôle of heredity seems assured. The author cannot confirm Habermann's recently expressed opinion on the causal connection between otosclerosis and syphilis. The next chapter treats of the functional examination, and importance is attached to Gellé's test. After describing the course and symptoms, mention is made of the many methods of treatment by way of the Eustachian tube and by operation, which have now all been abandoned; of the remedies given internally, phosphorus as suggested by Siebenmann seems to be the most promising. Finally the complete literature is appended.

This clear and unbiased exposition of an enigmatical disease is a welcome addition to otological literature.

A. K.

V. **Die Verletzungen des Gehörorgans.** (The Injuries of the Ear.) By Professor A. PASSOW, Berlin. Pp. 276. 1905.

The injuries to which the ear is subject are taken up in the following order of the individual parts: Auricle including a de-

scription of othematoma and perichondritis, external canal, drum membrane, tympanum with foreign bodies in the ear, Eustachian tube, mastoid process, labyrinth, and auditory nerve. The conditions are carefully described, with illustrations and personal observations, and the literature is cited. The chapter on labyrinth injuries is especially complete, and includes fractures of base of skull and labyrinth concussion. A chapter is devoted to hysteria and traumatic neurosis. In conclusion, the subject of accident insurance, which is receiving a great deal of attention at present in Germany, is treated.

The author's style is attractive and the presentation of the subject clear and thorough.

A. K.

VI. Die Eiterungen des Ohrlabyrinths. (On Suppurations of the Labyrinth.) By Professor E. P. FRIEDRICH, Kiel. Pp. 136. 1905.

The subject of labyrinth suppurations has received more attention in recent years, especially since the appearance of Hinsberg's excellent article (these ARCHIVES, Vol. XXXI., 1902). The basis of Professor Friedrich's investigations is furnished by twenty-seven personally observed cases from the Ear Clinic in Kiel, which are fully reported with temperature charts and eighteen plates illustrating pathological changes in the labyrinth. With full use of the literature the subject is treated systematically and thoroughly.

According to the author, the proportion of labyrinth suppurations may be expressed as one to every one hundred cases of purulent otitis. Infection usually passes through one of the two windows. A method of extension from the labyrinth to the skull, whose importance has been disregarded, is the passage along the aqueductus cochleæ. The clinical symptoms of labyrinth suppuration occupy an important part of the book. The treatment, which is of course surgical, intends to expose the purulent focus in the labyrinth and eradicate the diseased parts. In this we must be guided by the conditions found at operation. The opening up of the labyrinth is always dangerous, hence should only be undertaken when together with clinical labyrinth symptoms there are a fistula or granulations on the labyrinth wall.

The study of this book will be found most instructive and stimulating. The author has unquestionably advanced our knowledge of this important subject.

A. K.

MISCELLANEOUS NOTES.

Professor Karl Grunert died on September 25, 1905, at Halle a. S., Germany, in his fortieth year. His death occurred unexpectedly from the rapid aggravation of diabetes from which he had suffered some years.

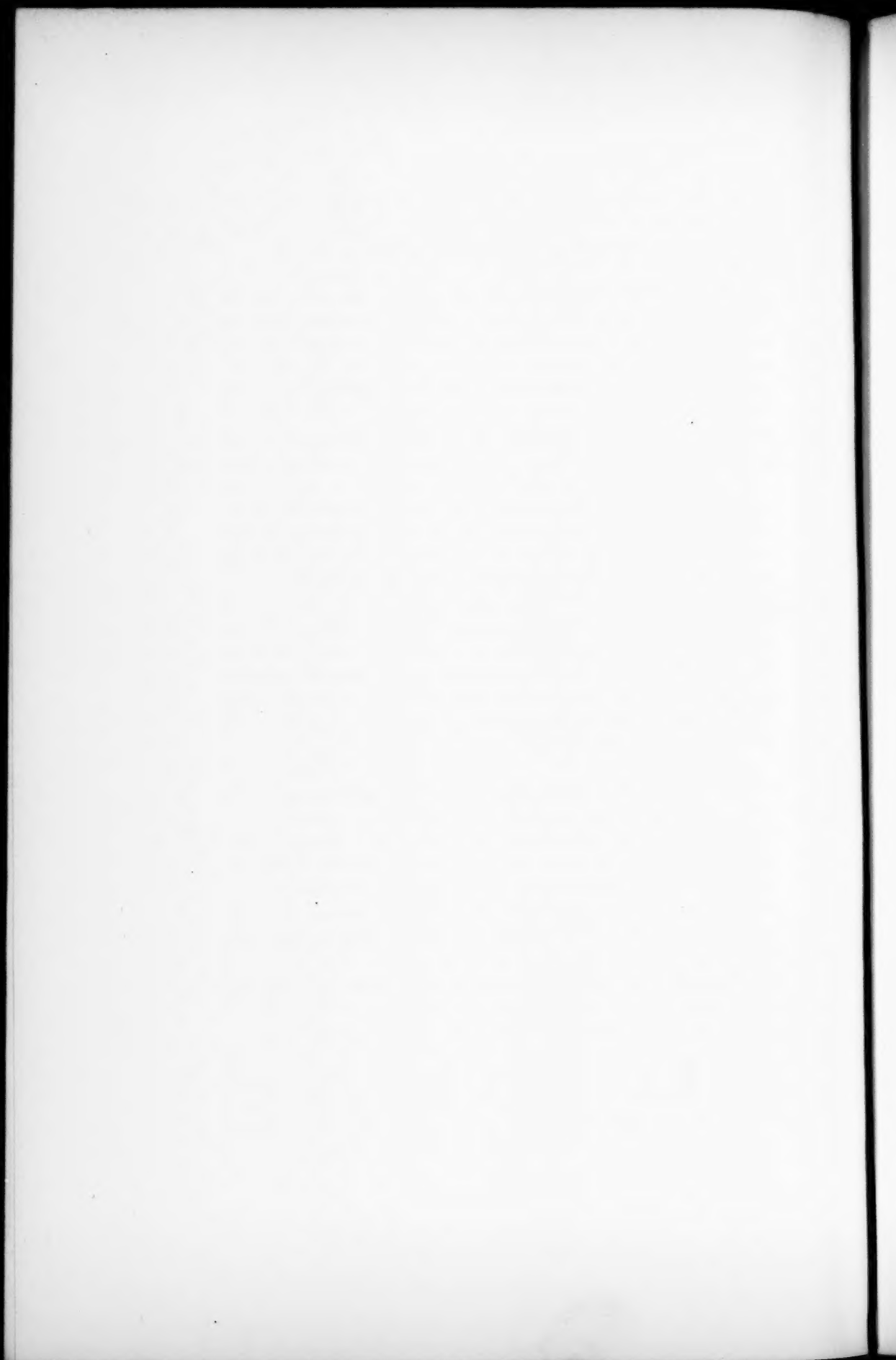
In Otology Grunert's name has been closely associated with the Ear Clinic in Halle, which he has practically conducted in recent years, especially since Professor Schwartz's retirement from ill-health. His publications in the *Arch. f. Ohrenheilkunde* have been numerous and have been chiefly in the line of the surgical and clinical development of purulent ear disease and its endocranial complications. He recently published a monograph on the operation for *Jugular Bulb Thrombosis*, and together with Schwartz wrote an *Einführung in die Ohrenheilkunde*.

Grunert was particularly successful as a teacher; his courses of individual instruction have been especially popular with young American and English otologists, many of whom owe him a great debt of gratitude. As a man his good nature and fair-mindedness won him many friends. Otology loses in him an enthusiastic, hard worker, whose dominant aim was the elevation of his specialty.

A. K.

Professor Lucae, the director of the Berlin University Ear Clinic, celebrated his seventieth birthday on July 31, 1905. The day was marked by the usual ceremonies. Many friends, pupils, and delegates from various medical societies called to express their congratulations. A "Festschrift" was also presented, composed of numerous articles on otological subjects, the first being some very interesting reminiscences by Professor Schwartz.

Professor Politzer celebrated his seventieth birthday on October 1, 1905.



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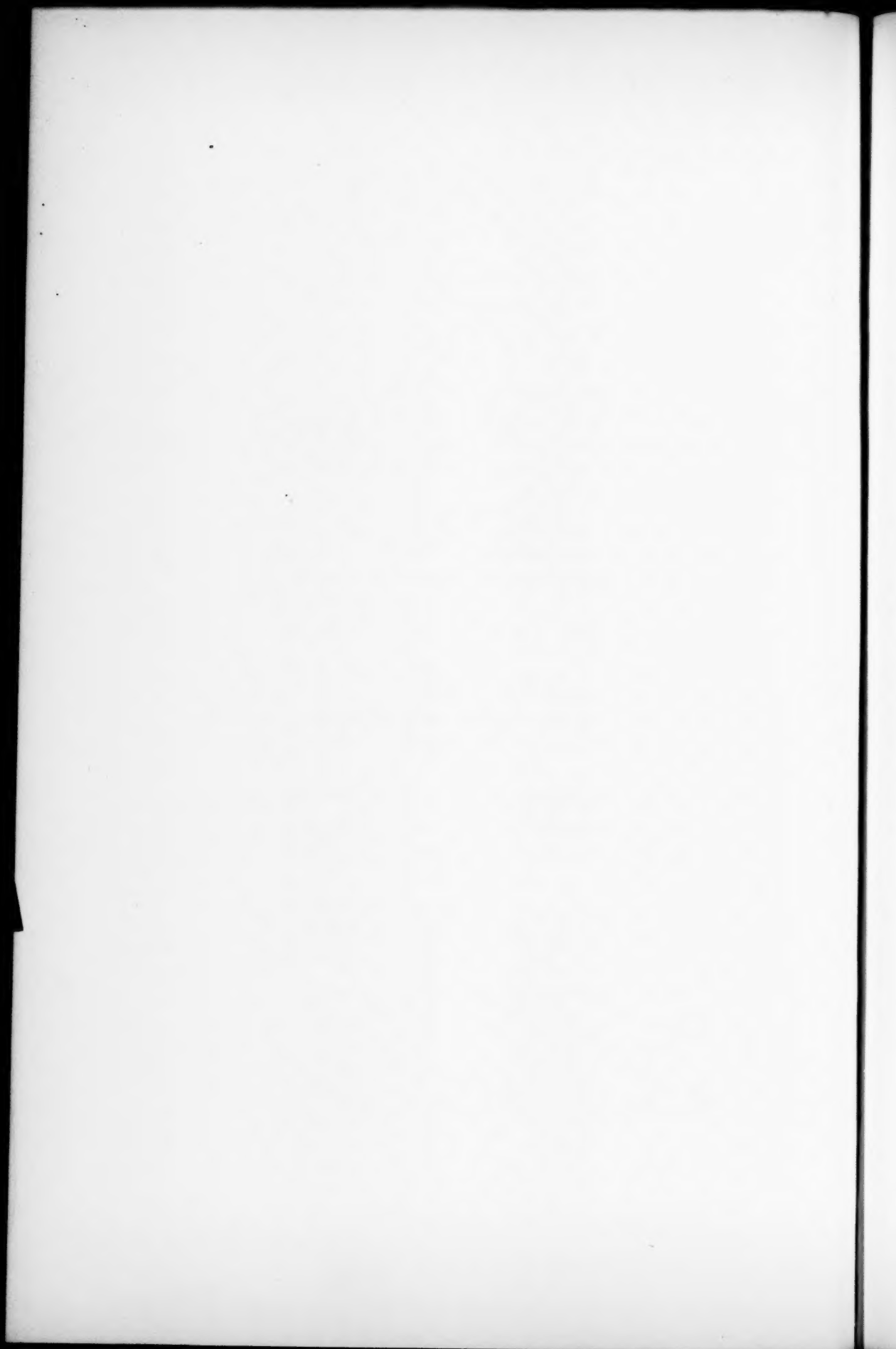
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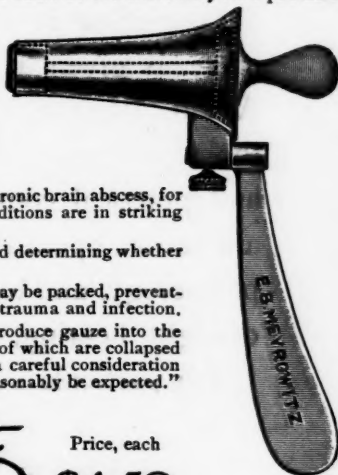
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